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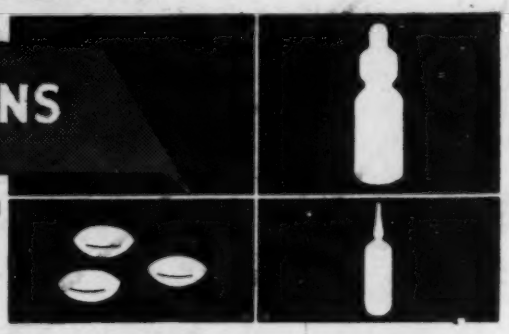

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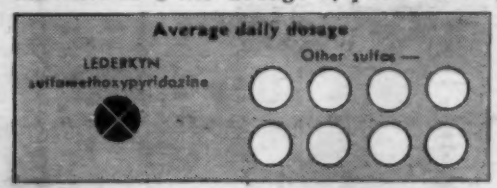

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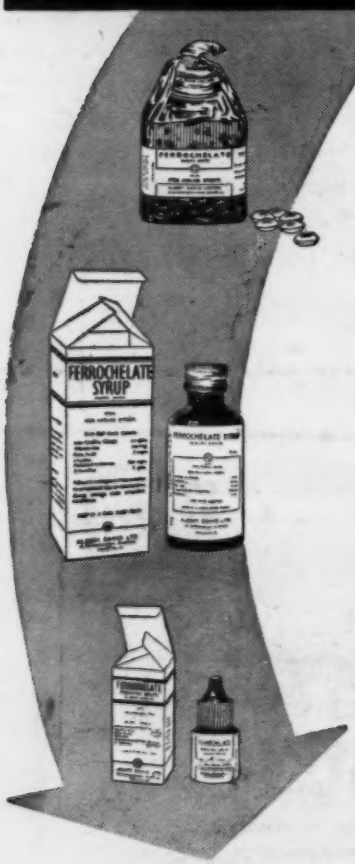

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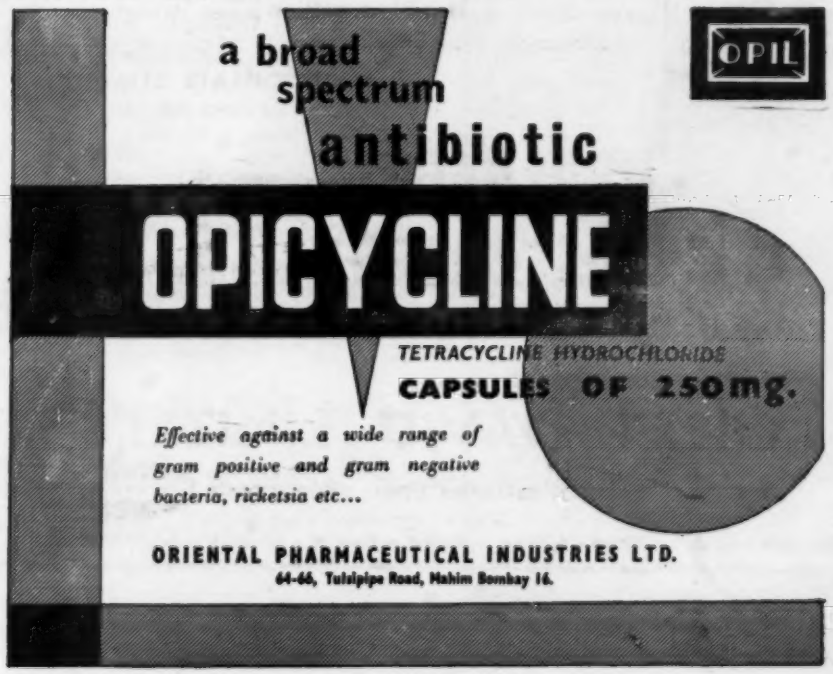

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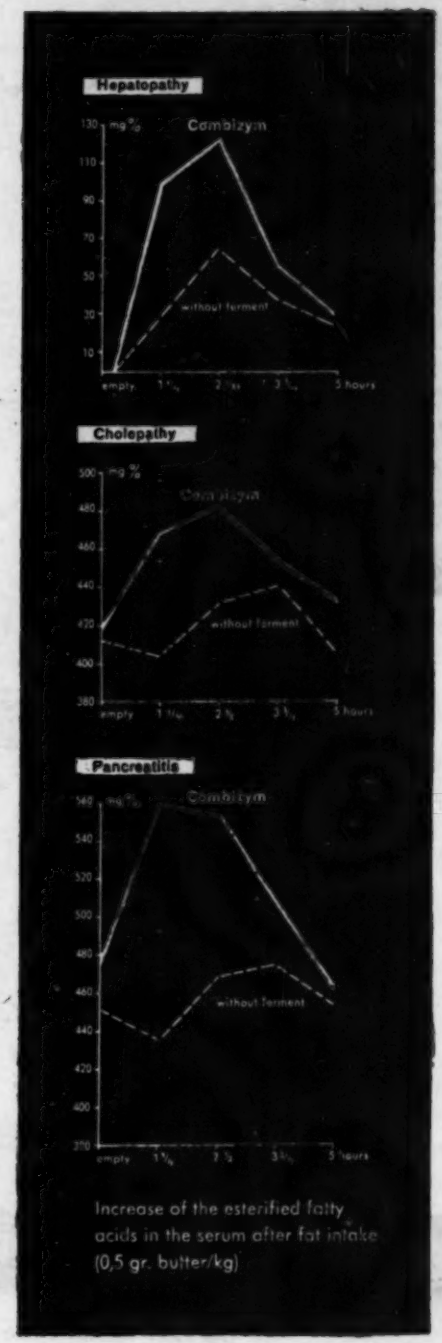

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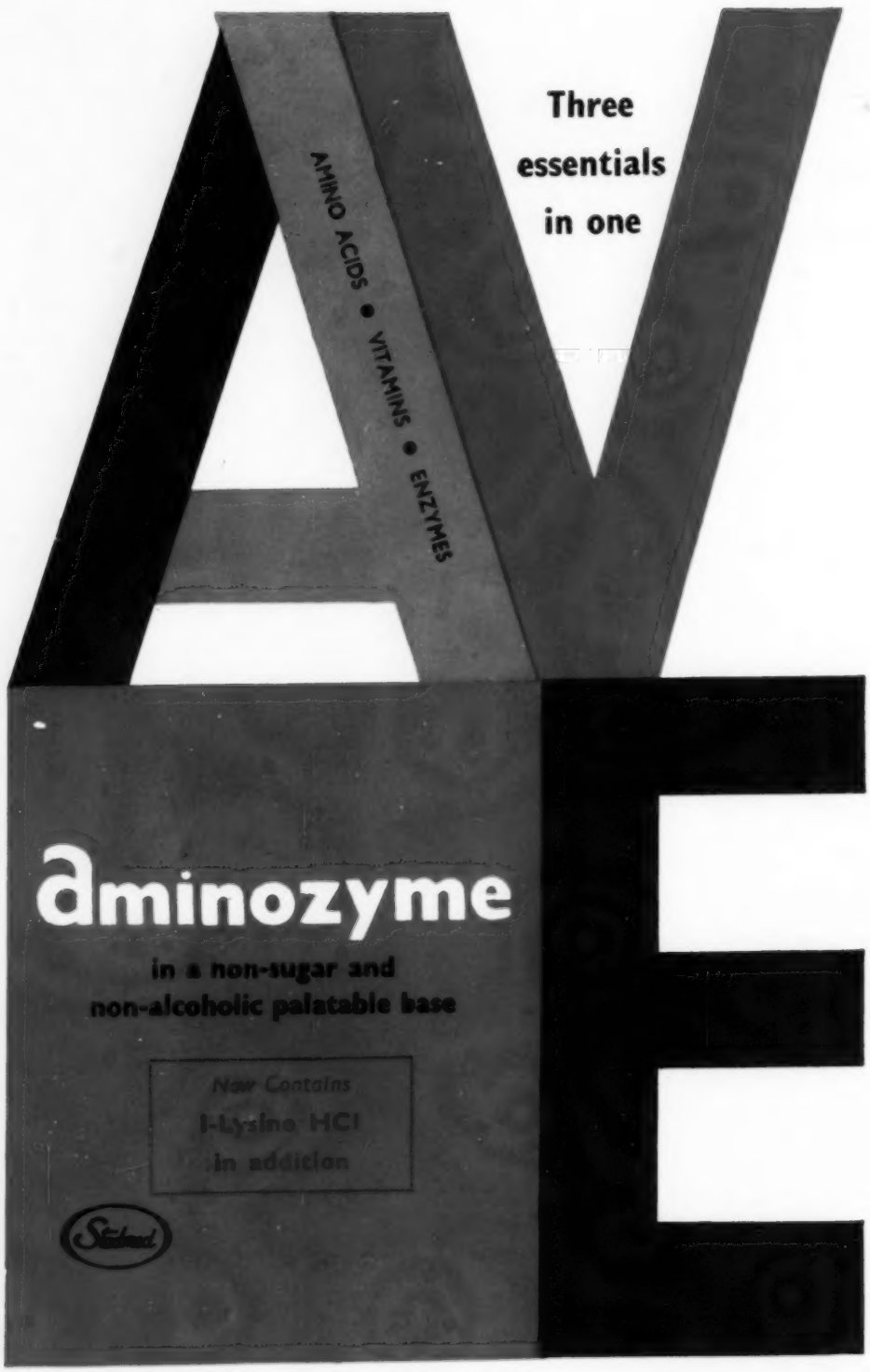
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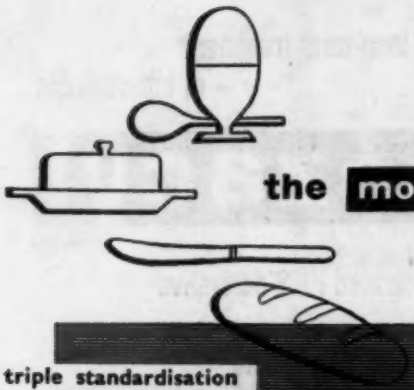

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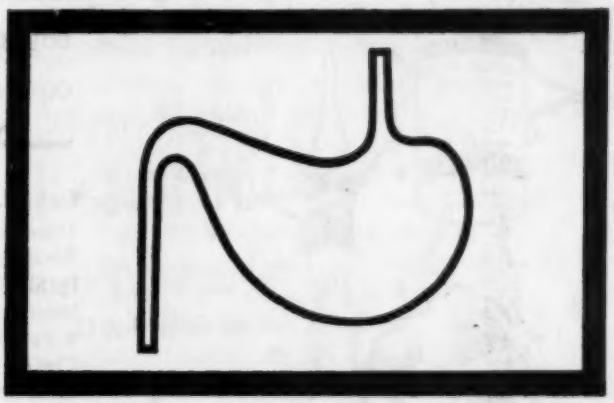

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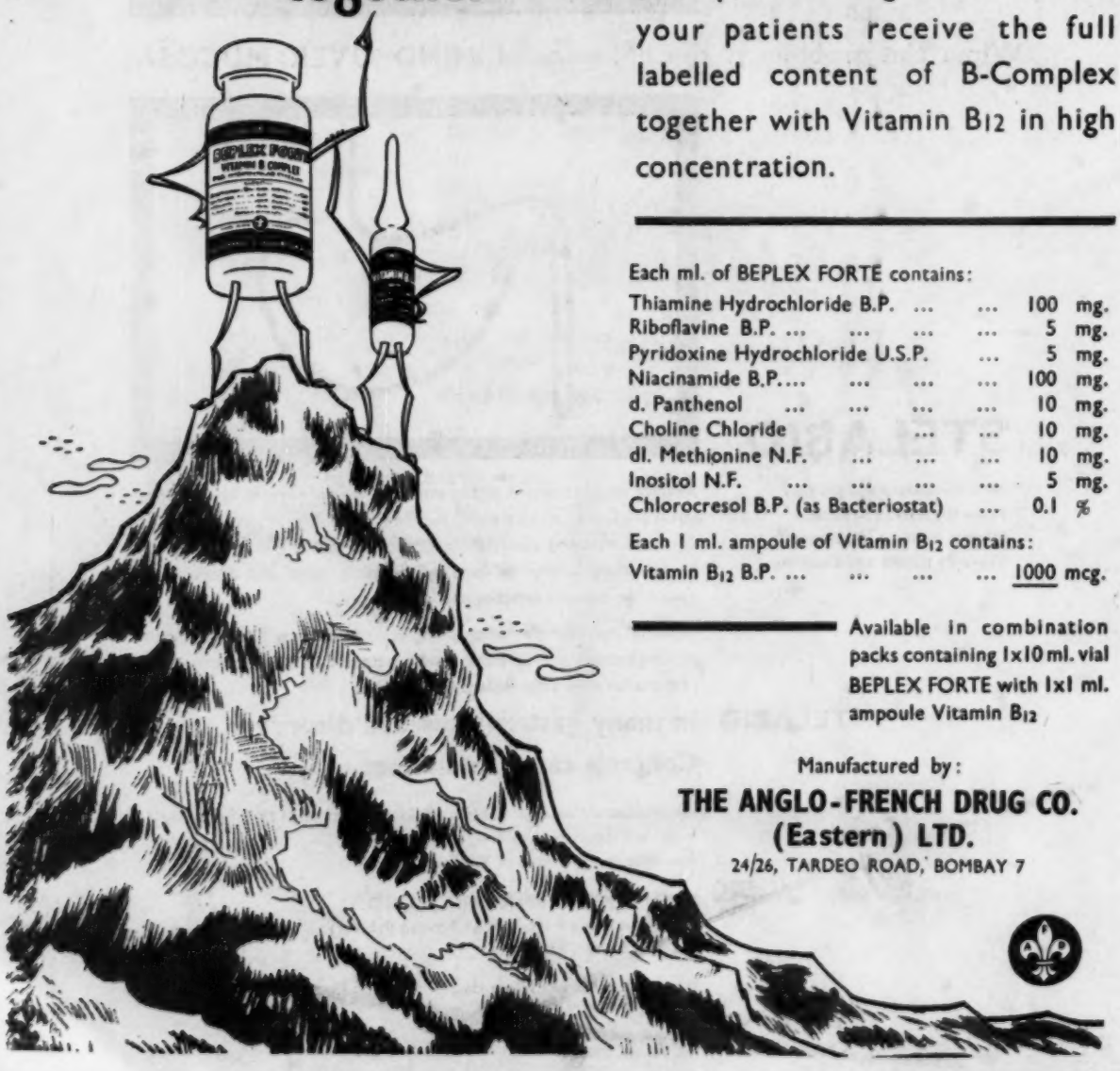

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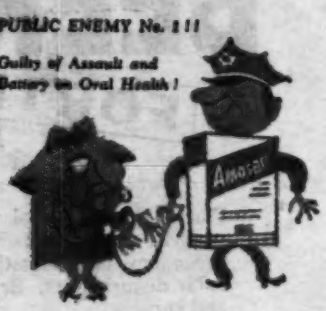

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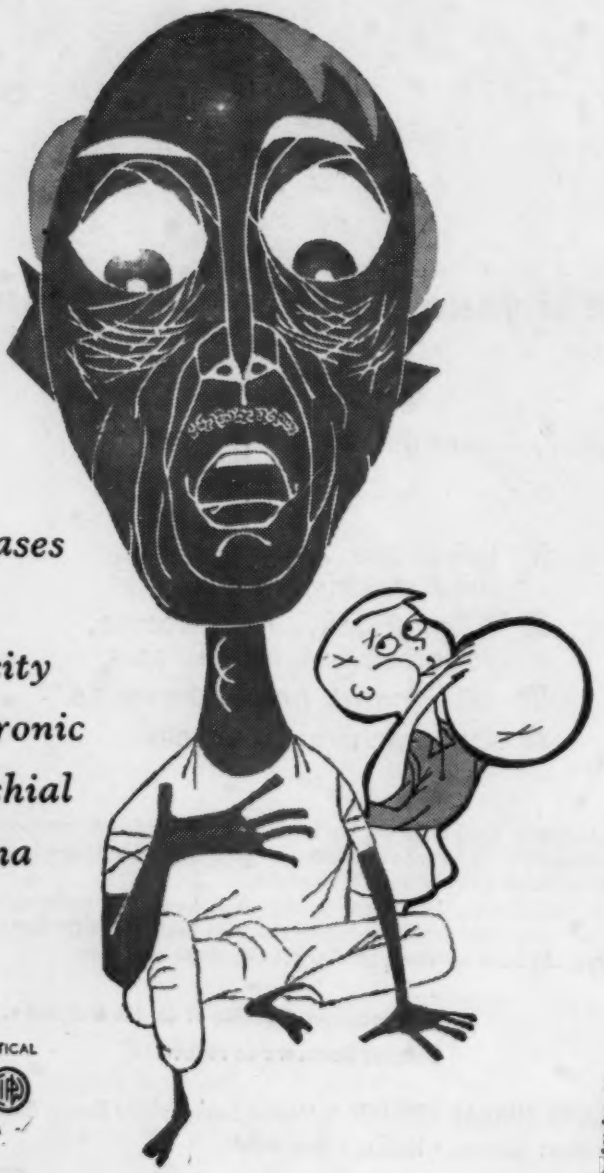

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CALCUTTA
OCTOBER 1, 1961

ORIGINAL ARTICLES

TROPICAL EOSINOPHILIA: AN AETIOPATHOLOGICAL STUDY

R. N. CHAUDHURI, M.B., F.R.C.P.E., T.D.D., F.N.I.
Professor of Tropical Medicine
AND
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Assistant Research Officer (I.C.M.R.)*
School of Tropical Medicine, Calcutta

During the past two years experiments were carried out to see the effect of dog ascarids (*Toxocara canis*) on guinea-pigs with special reference to the degree and persistence of blood eosinophilia and the morbid changes that may occur in the lung and liver. Altogether thirty-six animals having a total W.B.C. count between 5,000 and 8,000 per c.mm. with 0-3 per cent eosinophils were fed with a single dose of embryonated eggs of *Toxocara canis* (approximately 1000-1500 in number). This was soon followed by a striking eosinophilic leucocytosis. The total white cell count steadily rose up to a maximum of 15,000 to 19,000 per c.mm. with 30 to 55 per cent eosinophils in 32 animals within 2-3 weeks of the feed. This was less marked in the remaining four. The maximum absolute eosinophils were between 4,900 and 11,500 per c.mm. This high level of eosinophilic leucocytosis persisted for an average period of six weeks. At this stage, the chest of 6 animals were x-rayed ; 4 of them showed distinct mottlings in the lung fields as compared to the normal appearance before the feeding experiment (Figs. 1 and 2, *vide* Plate).

Twelve animals were sacrificed for studying the changes in the lungs and liver. On naked eye examination both the organs showed small discrete pinkish white elevated nodules distributed diffusely (Fig. 3, *vide* Plate). Histological examination of the lungs revealed (a) marked peribronchial accumulation of eosinophils (Fig. 4, *vide* Plate) often with swollen and folded bronchiolar mucosa with an exudate in the lumen rich in eosinophils (Fig. 5, *vide* Plate), (b) patchy areas of consolidation with accumulation of eosinophils and phagocytes within the alveoli and interalveolar spaces (Fig. 6, *vide* Plate), and (c) occasional segments of larva. In the liver, numerous granulomatous areas were observed, a typical one usually contained a larva or larval fragment in the centre, which was surrounded by epithelioid cells with a peripheral zone of eosinophils and lymphocytes (Fig. 7, *vide* Plate).

Rest of the infected animals were followed up for six months and some were sacrificed at intervals. Follow-up observations revealed gradual reduction of the total leucocyte count and percentage of eosinophils with occasional fluctuations, but usually varying degree of leucocytosis, with 15-20 per cent persisted throughout the period. Naked eye examination of the lungs and liver revealed at this stage a lesser number of nodular lesions. Histologically, the lungs showed eosinophilic accumulations and exudates, as above though less marked, but a striking feature at this stage was the occasional presence of granuloma-

* At present, Assistant Professor of Tropical Medicine.

tous lesions with a larval remnant or eosinophilic hyaline mass at the centre, with peripheral acccumulations of epithelioid cells, lymphocytes and eosinophils (Fig. 8, *vide* Plate) with localised area of pleural thickening over a subpleural granuloma (Fig. 9, *vide* Plate). In the liver sections, granulomatous lesions persisted and in the centre some contained larval element while others had a hyaline material or debris only surrounded by histiocytes, eosinophils and occasional lymphocytes at the periphery (Fig. 10, *vide* Plate).

In order to compare the pulmonary lesions in exerimental animals to those found in a clinical case lung biopsy was done in one patient.

Case Report

P. B. S., Hindu, male, aged 30, an electrical mechanic by occupation, was under our observation recently with complaints of chronic cough and respiratory spasm especially at late night, at frequent intervals for 10 years. They were worse during summer months. Expectoration was scanty, often containing particles like 'boiled sago grains.' There was no history of fever. Eosinophilic leucocytosis was found on blood examination and the diagnosis of tropical eosinophilia was made in 1951, 1953 and 1959, six injections of acetylarsan being given each time with relief and reduction of eosinophil count, only to recur after a year or two. Following the second course of injections he developed dermatosis which gradually cleared up. There was history of pneumonia in the past. Family history was non-contributory.

On examination the general condition was fair, chest emphysematous; breath sounds vesicular with prolonged expiration; rales and rhonchi scattered on both sides. No enlargement of lymph glands; the spleen not palpable. The liver palpable and slightly tender. The heart and blood pressure normal. Throat normal.

Investigations showed haemoglobin 12·18 g. per cent, total leucocytes 31,000 per c.mm., absolute eosinophils 22,750 per c.mm., E.S.R. 70 mm. (first hour). No microfilaria was found in the peripheral blood. Stool—trichuris and oxyuris ova found. Urine—clear. Sputum—'sago grain' particles visible in the viscid sputum; microscopically—masses of eosinophil cells with a few pus cells, epithelial cells and debris. Skiagram of chest—coarse mottlinga distributed over both the lung fields.

Lung biopsy showed two types of reactions, viz., (a) areas of patchy consolidation with alveolar spaces filled with eosinophils and alveolar phagocytes and their walls infiltrated with similar cells (Fig. 11, *vide* Plate) and (b) nodular lesions consisting of a central necrotic eosinophilic material surrounded by epithelioid and giant cells with eosinophils at the periphery (Fig. 12, *vide* Plate). Centre of these necrotic foci sometimes revealed rounded unstained vacuolated areas about 6-8 microns in diameter surrounded by giant cells (Fig. 13, *vide* Plate), other areas often showing some haematoxylin stained debris (Fig. 14, *vide* Plate).

With a view to finding out if comparable hepatic lesions as observed in experimental animals also occur in patients suffering from tropical eosinophilia the tissue (liver) obtained by Vim-Silverman needle biopsy was studied in a series of 34 cases, the relevant clinical data of which are summarised below:

All the patients were males aged between 6 and 49 years. The onset of illness was insidious in all, and the duration varied from 1½ months to 5 years. A few of them presented themselves with relapse, the previous attack having been treated with arsenical injections. The presenting symptom in 30 cases was cough with or without bronchial spasm of varying degree. Four patients had no pulmonary symptoms; they complained of indefinite abdominal pain. On physical examination 23 had pulmonary signs, mostly in the form of rhonchi and/or rales, while the remaining 11 had none. The liver was palpable up to 1 inch below the costal margin in 16 of them, the spleen was palpable in 5, but it was not possible to elucidate whether such enlargement was present previous to the current illness. Lymphadenopathy was observed in 9 patients. The main radiological features were mottlings and/or increased bronchovascular markings with increased hilar shadows; three had normal appearance. The leucocytes were 11,500-48,000 per c.mm. eosinophils 3,450-39,000 per c.mm. (30-82 per cent). Twentyfive per cent of them had intestinal parasites, e.g., hookworm, giardia, ascaris and *E. histolytica*. Intradermal tests with *dirofilaria immitis* antigen done in 11 cases were all strongly positive. Serum proteins were estimated in 22 cases. In general there was frequent rise in globulin fraction (above 3 g. per cent in most of the cases up to a maximum of 4·8 g. per cent) so as to raise the total protein above normal. The albumin fraction was normal or slightly depressed.

The biopsy tissue (liver) was fixed in formol-alcohol, paraffin sections were made and stained with haematoxylin and eosin, and Geimsa. In twenty cases the histological picture appeared normal, except for the presence of a few eosinophil cells in the sinusoids. In the remaining cases the following changes were noticed:

The commonest feature was accumulation of eosinophils in varying degree within the sinusoids. The eosinophilic accumulation appeared selective, with hardly any other type of leucocytes; nor it had any relation to the eosinophil count of the blood. In a few cases the eosinophil cells formed into clumps inside the sinusoids. The portal tracts in all cases showed infiltration with inflammatory cells, mostly lymphocytes and eosinophils and occasional endothelial cells. Fibroblastic proliferation in the portal tracts was evident in 5 cases,

Fig. 1—Skiagram of guinea pig's chest showing normal lung fields (before the feed of *T. canis* eggs).

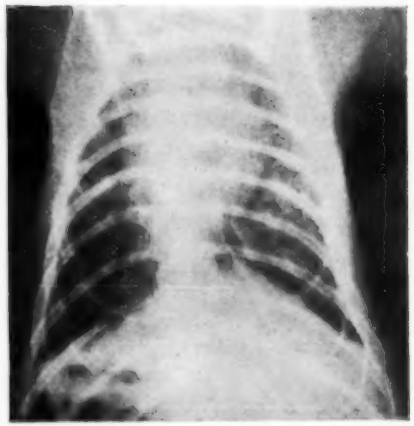

Fig. 2—Skiagram of the same guinea pig's chest showing mottled lung fields (six weeks after the feed of *T. canis*).

Fig. 3—Dissected guinea pig showing discrete elevated nodules on the lung and liver surface distributed diffusely.

Fig. 4—Showing peribronchial accumulation of eosinophil cells (dark stained) in an experimentally infected animal.

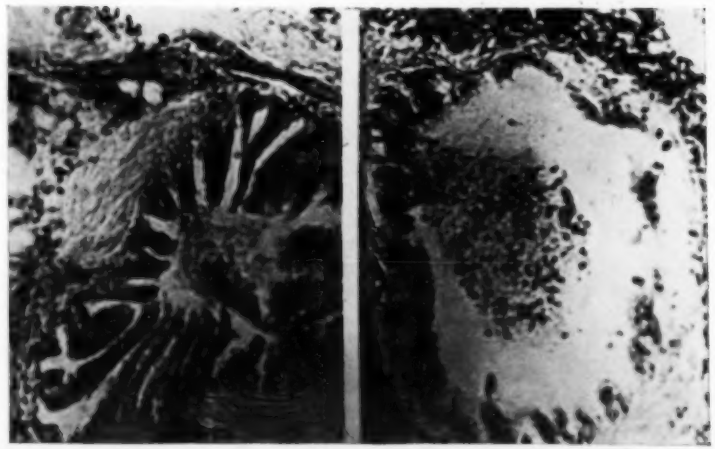

Fig. 5—Section of the lung from an experimental animal showing *(left)* swollen and folded bronchiolar mucosa, and *(right)* exudate in the bronchiolar lumen rich in eosinophils.

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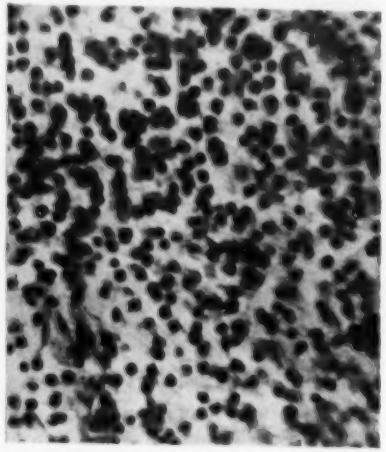

Fig. 6—Showing accumulation of eosinophils and phagocytes within the alveoli and interalveolar spaces of an infected guinea pig's lung.

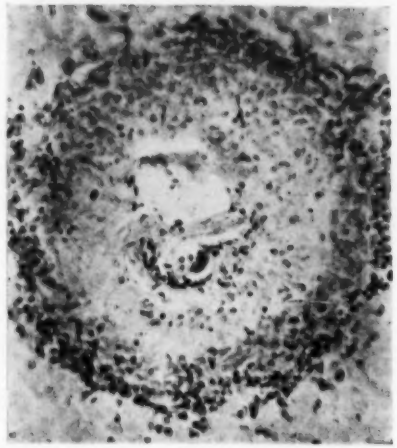

Fig. 7—A granuloma, in the liver of experimental guinea pig showing larval fragments in the centre, surrounded by epithelioid cells with a peripheral zone of eosinophils and a few lymphocytes.

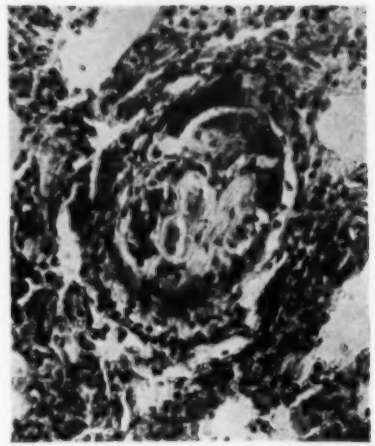

Fig. 8—Granuloma in the lung of an infected guinea pig showing a larval remnant and eosinophilic hyaline mass in the centre with epithelioid cells, lymphocytes and eosinophils in the periphery.

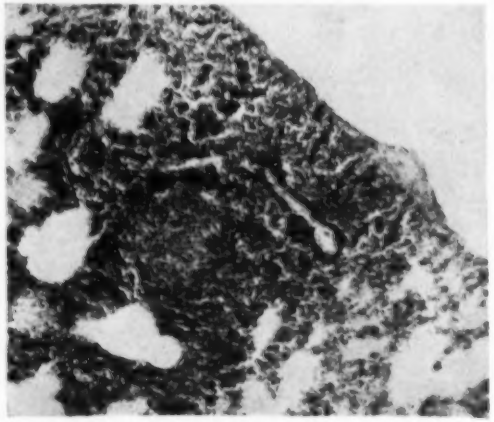

Fig. 9—Showing localised area of pleural thickening over a subpleural granuloma in guinea pig.

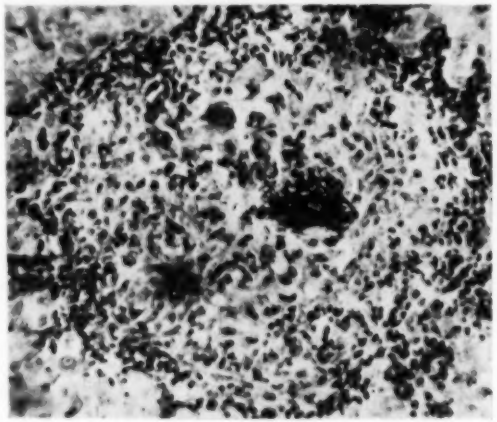

Fig. 10—Showing a granuloma in the liver of a guinea pig with some debris at the centre surrounded by histiocytes, eosinophils and occasional lymphocytes.

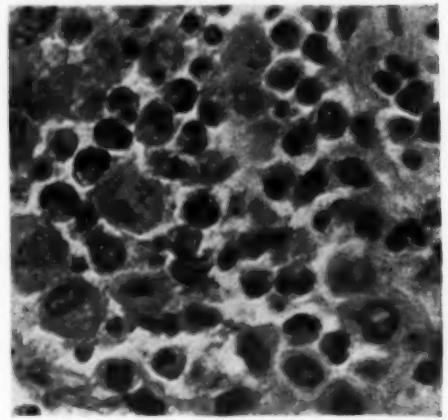

Fig. 11—Showing infiltration of eosinophils and alveolar phagocytes within the alveolar spaces and their walls in clinical case.

CHAUDHURI AND SAHA—*Tropical Eosinophilia : An Aetiopathological Study (p. 317)*

but there was no actual collagen deposit. The hepatic parenchyma appeared usually normal. But in two cases it showed granulomata, each consisting of a necrotic centre with a few epithelioid cells and lymphocytes, and a dense infiltration of eosinophils at the periphery (Fig. 15, *vide* Plate). Small foci of necrosis of liver cells with eosinophilic infiltration were seen in two other cases. Kupffer cells were hyperactive in three. Serial sections of the liver biopsy material were prepared in 12 cases and carefully examined but not a single section showed any larval material.

Discussion

Because of the benign course pathological observations on tropical eosinophilia have been very limited (Chaudhuri *et al*, 1954 ; Chaudhuri, 1956a). They are based mainly on the initial description by Viswanathan (1947, 1948) and subsequently by others (Beaver and Danaraj, 1958 ; D'Abrera, 1958 ; and Webb *et al*, 1960). The first three reports were from autopsy material, while that of Webb *et al* (1960) was mostly obtained by operative biopsy.

Observations on guinea-pig infected with *T. canis* in the present study indicate that hypereosinophilia tends to decrease in course of time with occasional fluctuations. The nodules on the lungs and liver may also be reduced in number, but they often persist. Distinct granulomata are observed more in the liver than in the lungs. The centre of a granuloma may show a larva or its segment, or simply a necrosed material or debris.

Fluctuations of eosinophilia in patients suffering from tropical eosinophilia are well known and granuloma formations have also been reported by autopsy and biopsy studies. The relative infrequency of the granulomata in the liver biopsy specimen in the present series might be due to the fact that here needle biopsy (a blind method) was employed, while in the series of Gault and Webb (1957) and Webb *et al* (1960) selective biopsy was done after laparotomy. No microfilaria was demonstrated in our case, but the vacuolated areas seen in the centre of sections of some granulomata in the lung indicate that this foreign matter might be acting as an exciting agent to the granuloma formation. Nevertheless, failure to demonstrate microfilaria, does not rule its causative role. The possible aetiological relation with *dirofilaria*, was observed by Chaudhuri (1956b) by showing strongly positive intracutaneous reactions with *Dirofilaria immitis* antigen in a series of patients suffering from tropical eosinophilia. Danaraj *et al* (1957) observed positive complement fixation tests with *Dirofilaria immitis* antigen. A more conclusive evidence of filarial aetiology was produced by Buckley's experiment (1958a, 1958b) showing that inoculation with infective filarial larvae from mosquitoes fed on a domestic cat carrying a natural infection with Malayan species of *Wuchereria pahangi* resulted in the appearance of signs and symptoms of the disease in man.

It has recently been pointed out by Beaver (1961) that the disease which is called eosinophilic lung in Singapore is also seen in India and elsewhere, but much of what is called tropical eosinophilia is not eosinophilic lung. Incidentally, the senior writer's first paper on the subject was entitled 'eosinophil lung'. (Chaudhuri, 1943). In any case a fair proportion of the cases reported as tropical eosinophilia is attributable to filariasis, which is usually zoonotic. However, occasionally cases are encountered with typical lung symptoms which do not respond to diethylcarbamazine and/or arsenic (Saha and Sen, 1961), thereby incriminating possible aetiological role of parasites other than filaria. D'Abrera (1958) found that the granuloma present in one case was due to larval forms of hookworm (*Necator americanus*). Beaver and Danaraj (1958) found numerous nematode larvae in the lung of an adult Indian in Singapore who died after a ten-day illness which was tentatively diagnosed as eosinophilic lung. The larvae were identified morphologically as belonging to the Ascaris species, probably *A. lumbricoides*. It was believed that the larvae were responsible for the disease observed in this case, and that pulmonary ascariasis and eosinophilic lung were separate but clinically similar disease entities. The observations, according to these authors, suggested that this and possibly other species of nematode larvae might cause pulmonary symptoms with hypereosinophilia resembling the condition described as eosinophilic lung, and in life the two conditions might be indistinguishable.

In the present experimental observations the lesions produced in the lungs, radiological mottling in the lung fields and histologically patchy areas of pneumonitis with eosinophilic exudates, often terminal peribronchial in distribution, and a tendency to chronic granuloma formation with hyaline eosinophilic material, at the centre, resemble those of tropical eosinophilia or eosinophilic lung as is also borne out by biopsy studies. The x-ray findings are largely dependent on these lesions. Chaudhuri and Saha (1959) reproduced features of tropical eosinophilia in a human volunteer infected with *T. canis*. Moreover, the eosinophilic leucocytosis produced in experimental

animals with *T. canis* infection does not respond to diethylcarbamazine (Saha and Chaudhuri, 1961). These facts indicate that the clinical syndrome of hypereosinophilia and lung symptoms can be caused by different parasites and the response to therapy depends on their sensitivity to the drug used. Perhaps, this is not all the answers to this perplexing problem. We have records of cases in which the onset of illness was sudden and acute with precipitation of symptoms in an otherwise healthy individual suggesting an allergic or hypersensitive reaction. The swollen and folded bronchiolar mucosa with excessive eosinophilic infiltration and exudates rich in eosinophils within the bronchiolar lumen also point to an allergic response.

The scope of further exploration indeed is yet to be exhausted before a final judgment can be pronounced regarding homogeneity or heterogeneity of the infecting agents on so intriguing a problem. Without going into the controversy of nomenclature, it may sound reasonable that the so-called disease 'tropical eosinophilia' is a selective and specialised expression of occult parasitism with one of the migratory nematodes depending to some extent on the prevalence of parasites in the locality. Further, it is greatly conditioned by its stage, degree, duration and immunological background and also the quality of the host-response.

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INHIBITION OF ALKALINE PHOSPHATASE ACTIVITY OF THE ENDOMETRIUM OF RABBIT BY ORAL ADMINISTRATION OF INDIGENOUS CONTRACEPTIVE DRUGS

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A few years back, while searching for a contraceptive drug effective by the oral route, the author came across a formula in Ayurvedic medicine (*Bhava-Prakasha*, 1888), consisting of *Embelia ribes* (N.O. Myriniceae), *Piper longum* (N.O. Piperaceae) and borax (and according to some authorities, a small amount of asafoetida might also be added). This preparation which is to be taken by the female partner immediately after menstruation for a few days has been reported emphatically to be effective in preventing conception.

At that time, in order to investigate whether such a preparation could in any way counteract the effect of oestrogen or progesterone on the rabbit's uterus, a few sets of experiments were carried out following the technique of McPhail (1934). No histological difference in the endometrium was detectable in the experimental group receiving this drug for 6 days (as compared with the control group) either in the effect of oestrogen or of the progesterone. Further work was not continued.

However, in the following years, many authenticated reports of the efficacy of this formula in clinical trials under medical supervision came to

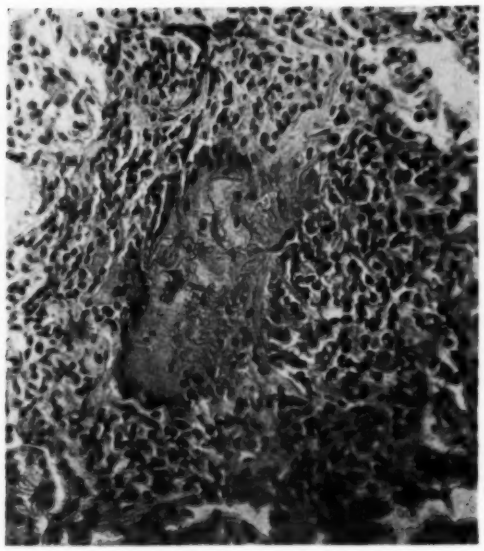


Fig. 12—Showing a granuloma in the human lung consisting of a central necrotic eosinophilic material surrounded by epithelioid and giant cells with peripheral accumulation of eosinophils.

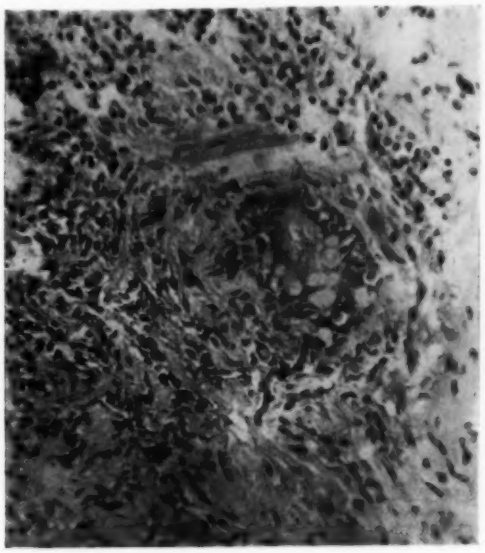


Fig. 13—Showing unstained vacuolated areas in the centre of a necrotic focus in a granuloma of the human lung.

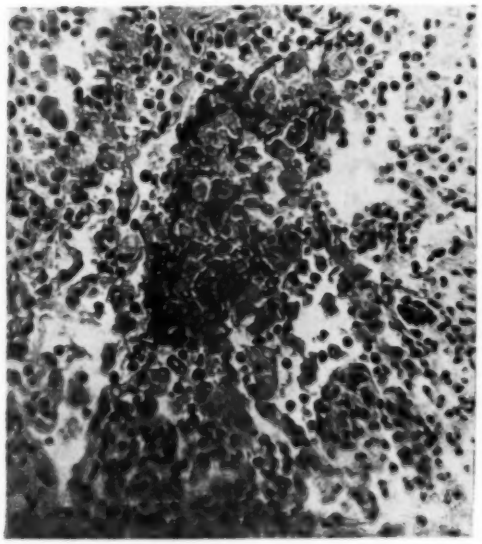


Fig. 14—An area in the human lung showing haematoxylin-stained debris.

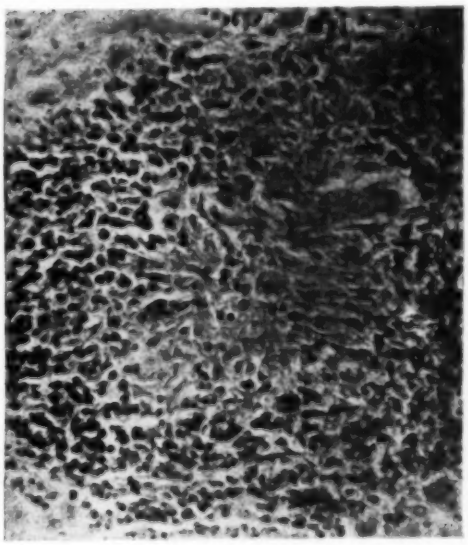
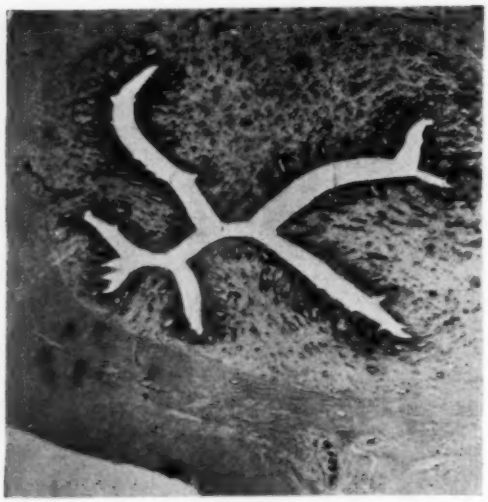
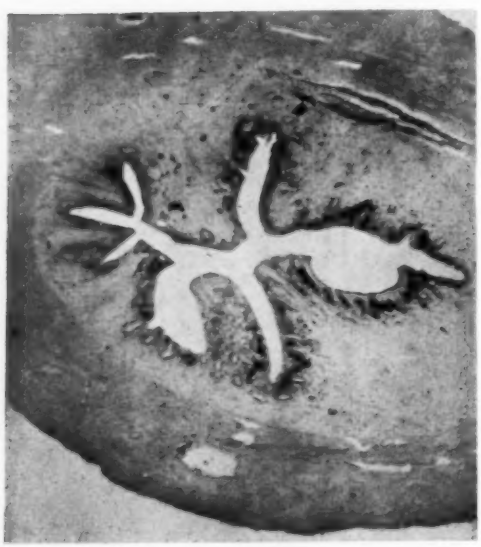


Fig. 15—A granuloma in the human liver consisting of a necrotic centre with a few epithelioid cells and lymphocytes and dense peripheral accumulation of eosinophils.



Figs. 1 and 2—Photomicrograph showing alkaline phosphatase reaction of the sections of rabbit's uterus treated with oestrogen and oral administration of the contraceptive drug. There is hardly any alkaline phosphatase reaction discernible.

[Views after incubation for 10 minutes × 20 and 20 minutes × 40 respectively]



Figs. 3 and 4—Photomicrograph showing alkaline phosphatase activity of the sections of rabbit's uterus treated with oestrogen. Distinct area of alkaline phosphatase activity is evident specially in the marginal area.

[Views after incubation for 10 minutes × 20 and 20 minutes × 80 respectively]

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our notice. Moreover, this drug was found to be harmless and non-toxic to experimental animal even in a very high concentration, weight for weight, compared with the therapeutic dose in human being.

Considering all these facts, it was decided to reinvestigate this problem once more. In view of the fact that no histological changes were found in our previous work, it was thought proper to investigate for any histochemical change that might occur in the endometrium after administration of this drug. In the immature female rabbit it has been reported by us (Banik and Chakravarti, 1957) that the administration of oestrogen not only causes hypertrophy of the endometrium and endometrial glands (without any villi formation), but also causes intense alkaline phosphatase activity in all parts of the mucosa including the ciliated border of the epithelial lining. Similar mobilisation of alkaline phosphatase with oestrogen has been reported in other mammalian species also (Knox *et al*, 1956). The present report describes the marked reduction of the mobilisation of alkaline phosphatase in the endometrium induced by oestrogen after oral administration of the above drug.

Experiment

Eight immature female rabbits fed *ad libitum* weighing between 790 and 950 g. each were used and these were divided into two groups, each of 4 rabbits.

Group I—This group served as control. Each animal received 3 injections of 50 I.U. of oestrogen in sesame oil, given on alternate days. All the injections were given in the hind leg muscle using each leg alternately.

Group II—This is the experimental group and each received the oestrogen as in group I. In addition they received 0·5 g. of powdered medicine (1 tablet of Oracon*) in suspension in water introduced by a small catheter into the stomach every morning for 5 days. The animals were sacrificed on the day following the last injection of oestrogen (6th day). Pieces of tissue from the tip, middle and cervical end of each cornu of the uterus were removed for examination. For the study of alkaline phosphatase activity, the tissue was fixed in 80 per cent chilled ethanol immediately after operation and sections, 6-microns thick, were made and incubated in sodium B-glycerophosphate substrate for 10, 20, 30 and 60 minutes following the technique of Gomori (1952). No counter-stain was used.

*Each tablet of Oracon contains by weight—*Embelia ribes* 50 per cent, *Piper longum* 30 per cent, borax 15 per cent and asafoetida 5 per cent.

Results

In the experimental group who got the drug, there was no alkaline phosphatase activity (Figs. 1 and 2, *vide* Plate) ; whereas in the control group there was distinct alkaline phosphatase reaction particularly in the border epithelium (Figs. 3 and 4, *vide* Plate). The difference was very much evident in the sections incubated for 10 minutes in the substrate (Figs. 1 and 3, *vide* Plate) Typical difference was seen in the sections incubated for 20 minutes (Figs. 2 and 4, *vide* Plate). It was evident that there was no change discernible in the morphological appearance, but in the group treated with the drugs the intense alkaline phosphatase activity, as evidenced by dark pigmentation in the epithelial lining cells in the control group, was conspicuous by its absence. Similar difference of varying intensity was noticeable in all the sections treated with the substrate at different intervals.

Discussion

The few sets of experiments described above at least proved that this drug markedly inhibited the effect of oestrogen in mobilising the alkaline phosphatase in the endometrium. Whether such inhibition of alkaline phosphatase activity is the cause of its alleged action in preventing conception has got to be thoroughly investigated. But this finding gives a strong indication that this drug may be effective by causing alteration in the cellular composition of the endometrium without much change of the gross morphology.

Alkaline phosphatase activity of the uterus is also dependent on the ovary, hypophysis and adrenal glands. Ovariectomy reduces this enzymic activity in the uterus which may be restored by oestrogen (Knox *et al*, 1956). Removal of pituitary and adrenal glands has been reported to have similar effect in the rat (Dempsey *et al*, 1949). So the effect observed in the present experiment might be indirectly mediated by depressing the function of the ovary, hypophysis or adrenal. Whatever may be the exact mode of action of the drug in inhibiting the effect of oestrogen, one may hazard the conjecture that such inhibition of the enzymic activity of this drug may prevent conception in human female, and it is worth giving a fair clinical trial.

There is still one further important comment to be considered. Like alkaline phosphatase activity, it is quite possible that this drug might induce other cytochemical changes in the endo-

metrium. Further work in this line is in progress and we are obtaining encouraging data to be reported shortly, showing that this drug causes other important histochemical changes in the endometrium.

Summary

In a group of immature rabbits, it was found that intense alkaline phosphatase reaction in the endometrium produced by administration of oestrogen, could be very much inhibited by simultaneous administration by mouth of an Ayurvedic preparation consisting of *Embelia ribes*, *Piper longum*, borax and asafoetida.

It is suggested that such enzymic inhibition and similar other effects of this drug as indicated by our subsequent works to be reported shortly might indicate the mode of action of this drug as an effective contraceptive.

Acknowledgment

My grateful thanks are due to Dr. G. Bhattacherjee, my colleague in the college and to Prof. H. N. Roy of School of Tropical Medicine, Calcutta. My thanks are also due to M/s. Solace Drugs, Calcutta, for supplying for this work the contraceptive drug 'Oracon' in tablet form.

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LABOUR FOLLOWING CAESAREAN SECTION

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There is a general feeling among obstetricians that the safety afforded to major surgical procedures by the advent of antibiotics and blood transfusion has resulted in a large increase in the number of caesarean sections. To a certain extent this attitude has resulted in significant improvements in maternal and perinatal mortality rates. But conservative obstetricians are worried about the alarming increase in the number of caesarean sections. It is necessary to evaluate the obstetric future of a woman after a caesarean section before we can feel happy with the immediate results of the operation.

What then are the dangers to a woman who becomes pregnant after a caesarean section? Her greatest danger is the rupture of the uterine scar either during pregnancy or labour. In the last 20 years it has been claimed that the old dictum "once a caesarean always a caesarean" was no longer true. However, Greenhill (1955) states that "I now almost routinely perform a caesarean section regardless of the indications for the first operation." Many obstetricians hold similar views. But a considerable number holds the view that once a caesarean need not be a caesarean again, but always a hospital delivery.

The truth of these statements and opinions can be assessed only by closely following pregnancies and labour in a large number of patients who had a caesarean section done. The commonly practised type of operation is the lower segment operation. Classical section is now employed rarely, if ever, only under very special circumstances. The greater incidence of rupture of scar after a classical section is generally accepted. The test of the strength of any scar is how it stands the strain of a future pregnancy and delivery. Hence, a correct picture of the problem can be obtained by finding out the incidence of scar rupture.

An attempt has been made to collect all cases who have had a caesarean section done and admitted into this hospital for confinement during 1953-1959 both years inclusive. Before this analysis is presented it is necessary to emphasise and present clearly some aspects of the background without which erroneous conclusions are likely to be drawn.

1. This hospital admits all cases, booked and unbooked. The booked cases actually account for only less than 20 per cent of the annual confinements which are over 12,000.

2. The cases under review comprise patients who had caesarean section done in various hospitals in the city (including those done in this hospital), outside the city or even outside the state.

3. In quite a number of instances no data are available regarding the indication and type of section and the postoperative data which are invaluable in planning the management in subsequent pregnancy.

4. The patients are generally so ignorant that very often even inspite of persistent advice they come to the hospital only after labour is established or after the scar has given way, some in actually moribund state—all these because of poor socio-economic condition and ignorance. It will be evident that the picture now being presented is in no way comparable to postcaesarean deliveries in western countries where all data are available to the obstetrician, and where patients attend antenatal clinics regularly and skilled attention is available to all.

Lane and Reid (1953) reported a greater incidence of scar rupture after lower segment caesarean section than after the classical. Dewhurst (1957) surveyed the literature and collected a large series of postcaesarean deliveries. From a group of hospitals in Calcutta (Panel discussion 1960) reports have been published of results of 441 postcaesarean deliveries.

During 1953-1959, 694 patients who had previous caesarean section done were attended to in this hospital. Table 1 shows the distribution according to the type of previous caesarean section ; the number dealt with by elective caesarean section, the number with vaginal delivery and in how many it was successful. It also shows the number of ruptured scars. For comparison this is included as the last item in Table 1 as was reported by Dewhurst (1957). The important difference between our figures and those of Dewhurst's is the absence of 'type unknown' in Dewhurst's series. Unfortunately there is a significant number under this heading in our series for reasons already explained, namely a number of these sections have been done elsewhere, and operation notes are not available and patients are unable to give any relevant data except that they had the operation done and that they have now come for another confinement. Under the circumstances while the overall incidence of scar rupture during pregnancy and labour could be correctly assessed, the accuracy becomes less when an attempt is made to assess the incidence in the different types and at different stages of pregnancy and labour because of the existence of the 'type unknown'. In spite of this inaccuracy it is proposed to present these figures, as the same yardstick is applied to both types of sections and the results therefore are comparable. It may also be stated that the caesarean section rate in this hospital during the period under review was 2·2 per cent.

The figures in Table 1 require explanation. There were 72 cases of 'type unknown', of which 10 were delivered by elective caesarean section, at which time the type of the previous section was found to be classical in 6 with no mention against the remaining four cases. Thus the total number of classical section would now be 196. Again among 62 patients in 'type unknown' group put down for vaginal delivery, 22 were delivered by caesarean section during the course of labour. At the time of section it was noticed that the previous section was classical in 16 and lower segment in 6. And finally, 18 cases admitted after rupture of the scar have not been included in Table 1. Of these 18 cases, 14 were classical and 4 lower segment. Hence the corrected figures would be:

Classical section ...	...	226
Lower segment section	...	442
Type unknown ...	...	44
Total	...	712

In this series of 712 patients who had previous caesarean section, there were 38 cases of rupture of the scar—an overall incidence of 5·3 per cent. Considerable difficulty is experienced in presenting a true, comprehensive and detailed analysis of these cases because of reasons already explained.

TABLE 1—SHOWING THE DISTRIBUTION OF CASES ACCORDING TO THE TYPE OF PREVIOUS CAESAREAN SECTION

Authors	Total number			Elective C.S.			In labour			Vaginal delivery			Scar rupture	
	C	LUS	TU	C	LUS	TU	C	LUS	TU	C	LUS	TU	C	LUS
Lawrence (1953)	440	449	—	222	139	—	178	310	—	74	121	—	4	2
Browne (1951)	16	76	—	—	—	—	16	76	—	16	76	—	—	1
Baker (1959)	—	100	—	—	17	—	—	83	—	—	74	—	—	1
Dewhurst (1957)	84	635	—	44	283	—	40	352	—	31	235	—	7	3
Bruce (1953) ...	—	41	—	—	—	—	—	41	—	—	34	—	—	—
Winchester and Browne ...	262	229	—	—	—	—	—	—	—	69	112	—	6	1
Menon (1961) ...	190	432	72	87	93	10	103	339	62	53	230	40	12	8

C=classical; LUS=lower uterine segment; TU=type unknown.

For the same the incidence of the rupture of the scar will also be higher than the figures published.

190 of the 694 cases (excluding 18 admitted after rupture) were dealt with by elective repeat caesarean section, an incidence of 27·4 per cent. 504 or 72·6 per cent were put down for a trial of vaginal delivery. In this group of 504 patients 181 had to be sectioned during labour for various indications including rupture of scar, of which there were 18 cases an incidence of 3·6 per cent. 323 patients had a successful vaginal delivery, either natural or by outlet forceps, an incidence of 64·1 per cent. In 2 patiens the lower segment scar was found to have given way, when the uterus was explored after delivery. Thus in a total of 504 patients in labour the scar gave way in 20—an overall rupture rate of 3·9 per cent.

The Incidence of Rupture

The gross incidence of rupture in this series of 712 cases was 38, i.e., 5·3 per cent. If 18 cases who were admitted after rupture are excluded, then among 694 cases there were 20 ruptures—an incidence of 2·9 per cent.

The classical scar accounted for 26 of the 38 ruptures, i.e., among 226 classical sections there were 26 scar ruptures—an incident of 11·5 per cent (Table 2). If correction is permitted for 14 cases admitted after rupture of the classical section scar, the incidence would be 12 among 212, i.e., 5·6 per cent among 442 cases with the lower segment operation, there were 12 scar ruptures —an incidence of 2·7 per cent. If correction is made for four patients admitted after rupture, then among 438 cases the scar gave way in 8, i.e., an incidence of 1·8 per cent. The test of a scar is labour. Hence its incidence in those put down for vaginal delivery would give a more correct idea. Among 19 postclassical caesarean patients who went into labour, scars gave way in 10 cases —an incidence of 8·4 per cent. Among 345 post lower segment caesarean patients the scar gave way in 8, i.e., in 2·3 per cent. 18 of the 38 patients were admitted into hospital after rupture, 14 classical and four lower segment scars.

Table 2—Showing Type of Scar Rupturing Before or During Labour

Type of scar	Pregnancy	Labour	Total
Classical	14	12	26
Lower uterine segment ...	2	10	12
Total ...	16	22	38

Of the 26 classical caesarean scar ruptures 14 had given way prior to labour, the duration of pregnancy being 28 weeks (earliest) to 38 weeks ; 2 of these occurred in patients in hospital waiting for elective caesarean section at term. Among the 12 lower segment ruptures 2 had given way during pregnancy and 10 during labour. There could be a slight discrepancy in this statement as at times the pain associated with commencing rupture of the scar especially near term could be mistaken for commencing labour. It is therefore not entirely correct to say that lower segment scar ruptures only in labour. In the classical caesarean section group all ruptures in pregnancy were complete ones. Among the 12 which ruptured in labour, in 8 rupture occurred before full cervical dilatation and engagement of the head, the membranes having ruptured prematurely. In two it occurred in the second stage and in 2 cases details were not available. There was only one case of incomplete rupture in the classical section cases. Thus the classical scar gives way with almost equal frequency in pregnancy and labour. Among the 12 lower segment scar ruptures, in 2 the scar gave way in late pregnancy (38-40 weeks). In two the rupture was diagnosed on exploration of the uterus after an outlet forceps delivery of live babies, while in the remainder the scar gave way before completion of the first stage. Among these 12, there were 9 complete and 3 incomplete ruptures.

A detailed analysis of the cases indicates that where labour terminated within 8-10 hours of commencement no scar gave way. The maximum incidence of rupture occurred where at the onset of pains the vertex was not engaged but mobile at the brim, the membranes had ruptured prematurely, the cervix was not well effaced and the uterine action tardy. The average duration of labour has invariably been between 10-18 hours. Clinically the non-engagement of the head was not due to disproportion and the indication for previous caesarean section in the group was evenly distributed between cephalopelvic disproportion, antepartum haemorrhage and uterine inertia. In one, the indication was eclampsia.

Successful Vaginal Delivery

504 patients were submitted to a trial of vaginal delivery ; 119 after classical section, 339 after lower segment caesarean section and in 44 the type of section was unknown. Successful vaginal delivery was accomplished either naturally or by outlet forceps in 324,—a success rate of 64·4 per cent. The perinatal mortality in this series was 5·6 per cent.

On analysing the successful vaginal deliveries it is observed that in 82 per cent there was early engagement of the head with cervical effacement, and fairly good uterine action, resulting in delivery of live babies within 12 hours of the commencement of labour.

TABLE 3—SHOWING INDICATIONS FOR PREVIOUS CAESAREAN SECTION AMONG 38 CASES OF SCAR RUPTURE

Indications	No. of cases
Cephalopelvic disproportion	9
Malpresentation	3
Uterine inertia	4
Placenta praevia	2
Failed induction	1
Cord prolapse	2
Constriction ring	1
Eclampsia	1
Foetal distress	2
Obstructed labour	1
Not known	12

The indications for previous caesarean section in 38 cases of rupture at scars are shown in Table 3.

The parity and rupture of the scar—The incidence of scar ruptures in relation to parity is shown in Table 4.

TABLE 4—SHOWING INCIDENCE OF SCAR RUPTURE IN RELATION TO GRAVIDA

Gravida	2	3	4	5	6	7	Total
No. of cases ...	20	9	3	4	1	1	38

In this group four patients had one vaginal delivery each and 3 had two vaginal deliveries, each after the previous section, while 7 had one to three deliveries each prior to the section.

Presentations—The incidence of scar rupture in relation to the foetal presentation is shown in Table 5.

TABLE 5—SHOWING TYPE OF PRESENTATION

Type of presentation	No. of cases
Vertex	24
Breech	1
Transverse	3
Compound	1
Face	1
Not known	8

Rupture during pregnancy—As stated previously 16 cases ruptured during pregnancy. Among the 16 cases, classical scar accounted for 14 and lower segment for 2. This clearly indicates that classical scar gives way often during pregnancy. The duration of pregnancy ranged from 28 to 38 weeks. One of the arguments against routine caesarean section after a previous section is that rupture during pregnancy cannot be prevented. Hence, there are many who resort to elective caesarean section in these cases about the 38th week of pregnancy if the uterus has not ruptured by that time. The above principle is not followed in our hospital.

Signs and symptoms—Marked degree of shock and collapse with fall of systolic blood pressure below 100 mm. Hg (in 3 it was not recordable) were found in 22 cases of rupture of the classical scar. In 4 it was of a moderate degree. In the 12 lower segment scar ruptures such marked degree of shock was found only in 6 cases, in 2 it was minimal and in four moderate.

It is difficult to gauge the significance of pain and tenderness over the region of the uterine scar as a premonitory symptom or sign of threatening rupture. But this cannot be ignored. Unaccountable irregularities in foetal heart in the absence of effective uterine contractions is a warning sign. Bleeding per vagina, be it even slight, or passage of blood-stained urine while the head is still unengaged is often a sign of rupture or an impending one. When the foetus escapes into the peritoneal cavity, and shock sets in, the diagnosis becomes obvious. Incomplete tears of the lower segment may sometimes result in a haematoma lifting up the uterovesical fold of peritoneum and this may at times be evident in the form of a suprapubic bulge which is often tender on palpation (there were 3 such cases in this series). There may be associated difficulty in passing urine and pain due to stretching of the peritoneum. A haematoma may form in the broad ligament giving rise to severe pain and shock (there were 2 such cases).

MANAGEMENT

Prevention by efficient antenatal and intranatal care is the keynote of management. After a previous section all patients should be admitted into hospital by the 34th to 36th week of pregnancy and labour conducted only in well-equipped institutions. A careful and detailed history of previous caesarean section must be obtained if possible, special enquiries being made into indication and time of section, type of operation, postoperative period and complications. In the absence

of such information extreme caution should be exercised in putting a patient down for vaginal delivery. The pelvis must be assessed clinically and if necessary radiologically. In case of diagnosis of cephalopelvic disproportion, even if of mild degree, the patient should have the benefit of elective caesarean section at term. In general, elective caesarean section is done when the indication for previous section is a recurring one.

It is a common experience that where a previous caesarean section has been done for a failed trial labour, vaginal delivery has been successfully conducted at a subsequent pregnancy. It is well known that various factors, especially uterine inertia, may vitiate the chances of a successful trial labour. Hence in the absence of disproportion in a subsequent pregnancy an attempt should be made of a vaginal delivery, even if the previous section has been done for disproportion. Induction of premature labour to avoid caesarean section is not recommended, and elective repeat caesarean section should be done at the onset of labour. As majority of patients are unable to give the date of their last meustrual period, major difficulties arise in assessing the maturity of the foetus. In the absence of any obvious indication for repeat caesarean section, especially when it has been done for a non-recurring indication, the patients are selected for vaginal delivery, provided there is no malpresentation. Breech presentation *per se*, especially in a patient who has had a vaginal delivery, need not be considered as indication for elective caesarean section provided the baby is of average size, pelvis adequate and good care is exercised during labour.

The management of these cases in labour is a problem for the obstetrician. Rupture of the scar whatever be its situation should be accepted as a potential danger. Maternal pulse, foetal heart rate and uterine action and progress of the presenting part should be carefully observed. Tenderness over the upper segment of the abdomen in cases of scar of classical section and over the hypogastrium in case of lower segment ones should arouse suspicion. Vaginal bleeding, be it even slight, associated with irregularities of the foetal heart, should be considered as an indication for termination of labour by abdominal section. Foetal distress alone always requires termination of labour per abdomen if easy vaginal delivery cannot be effected forthwith.

With early engagement of the vertex, good uterine action and steady progress in labour patients can usually be delivered successfully vaginally, especially if they had previous vaginal delivery. The second stage is best cut short by outlet forceps traction soon after the head has descended in the perineum. If the delivery is completed under anaesthesia it is a routine practice to explore the uterus. Where the delivery is natural in the absence of any extra bleeding or unexplainable shock in the patient no such exploration is done as a routine. It is in the group of patients where the head is unengaged at the onset of labour, the membranes rupture prematurely an uterine action is tardy with slow progress, that rupture of the scar has usually occurred even in the absence of disproportion or malpresentation. It is our experience that when such conditions prevail it would seem advisable to terminate labour not later than 8 to 10 hours from its onset. If it is permitted to continue longer, chances of rupture of the scar are greater. Most of the ruptures in our series, except those in pregnancy, have occurred in this group of cases.

The fact that no rupture of the scar has occurred when labour ended within 8 to 10 hours of the start is a pointer. Rupture of the scar can be reduced to the minimum if cases where 8-10 hours of labour has failed to produce sufficient progress, indicating reasonably quick termination, are subjected to caesarean section instead of further persisting in trials for vaginal delivery. This does not mean that rupture has not occurred earlier.

Before these patients are permitted to go into labour, properly grouped blood must be made available in sufficient quantities for intravenous transfusion. Once rupture has occurred immediate laparotomy with resuscitative measures e.g., blood transfusion, is indicated. At laparotomy, hysterectomy, or suture of the rent with sterilisation can be done depending upon the type of the tear, age and parity of the patient and her general condition. In badly shocked patients it would be wise to avoid hysterectomy and resort to suture of the rent if it can be done along with sterilisation. In this series of 38 cases total hysterectomy was done in 3, subtotal in 16 and suture of the rent and sterilisation in 18 cases. One patient died even before she could be operated upon. Two mothers were lost and 3 babies were saved (one by classical and 2 by lower segment section). Discarding the patient who died within an hour of admission and in whom nothing but resuscitation was attempted, of 37 ruptured scars one mother was lost from rupture of classical caesarean section scar, which was treated by subtotal hysterectomy. This gives a mortality of 2·7 per cent. No mother among 12 lower segment scar ruptures was lost and 2 babies were saved. The gross perinatal mortality in the whole series was 12·8 per cent and the prematurity rate 16 per cent.

TABLE 6—SHOWING TYPE OF TREATMENT ADOPTED AND THE MORTALITY RATE

Type of treatment	Total hysterectomy	Subtotal hysterectomy	Suture and sterilisation	Resuscitation
No. of cases ...	3	16	18	1
Death	—	1	—	1

N.B.—All patients had blood transfusion—the quantity of transfusion ranged between 700 and 1,400 ml.

DISCUSSION

The overall incidence of rupture of the caesarean scar, whatever its type, is greater in this series than that reported by Dewhurst and others, especially for classical section. Dewhurst's figures are expressed as a percentage of (1) the total, (2) those in labour and (3) those in whom vaginal delivery took place. For the classical caesarean section his figures are 2·2 per cent of all cases, 4·7 per cent in labour and 8·9 per cent of those delivered vaginally. For lower segment caesarean section the comparable figures are 0·5 per cent, 0·8 per cent and 1·2 per cent respectively. In the author's series the figures for classical section are for all cases 5·6 per cent and for those in labour 8·4 per cent. For the lower segment operation they are 1·8 per cent and 2·3 per cent (excluding cases admitted after rupture).

The high incidence of rupture is obvious. Why is this incidence so high? Are there any special features other than lack of antenatal care and lack of relevant data available to the attending obstetrician regarding the previous section? Have the selection of cases for vaginal delivery been poor? Have they been permitted to remain in labour too long? These are questions which have to be answered. At the very outset difficulties experienced and the peculiar circumstances under which the hospital functions, have been emphasised. This is, however, true for almost all hospitals in India. The reported overall incidence of scar ruptures from a group of hospitals in Calcutta is about 3 per cent.

Has the selection of cases for vaginal delivery been poor?—Every attempt has been made to select the proper group. Apart from the 14 ruptures of classical scar and 2 of lower segment scars in pregnancy, all the 22 ruptures have occurred in labour, of which 18 took place in the hospital. That the selection of cases is not entirely at fault is shown by the fact that of 504 patients permitted to go into labour vaginal delivery was successful in 323 (64·1 per cent), and among the latter only 2 lower segment scars gave way. This was diagnosed on exploration after delivery; the scar having given way in the remaining cases during labour.

Have these patients been permitted to remain in labour too long?—This perhaps may be one reason. In almost all cases where the scar gave way the labour ranged for 10 to 26 hours. In nearly 80 per cent, there was delayed engagement of head, premature rupture of membranes, tardy uterine action and slow progress of labour. These patients were observed carefully. Pethidine was administered, and while waiting and hoping even in the absence of good uterine action the scar gave way. In none of these cases there was a malpresentation or disproportion. The babies weighed from 4½ to 6½ lbs. It is fully realised that all details regarding the previous section, indications, types, postoperative period, etc. are essential. A normal post-operative period is said to indicate a strong scar and a septic puerperium a weak one. As against this, cases with previous normal convalescence and the scar may still rupture in the next pregnancy.

The problem can be approached from another angle. During the period under review 164 cases of rupture uterus were dealt with in this hospital. Among these there were 38 caesarean scar ruptures (the present series), 95 spontaneous ruptures in labour and 31 traumatic ruptures. A study of the spontaneous ruptures in labour revealed that 24 occurred in the hospital while under the care of the medical officers. The parity of these patients ranged from 2 to 5 and they gave good obstetric record, presentation by vertex, and babies of average size. At the onset of pains membranes ruptured prematurely, vertex was unengaged and uterine action poor. These patients were given sedatives and watched carefully for establishment of uterine action and engagement of the vertex so that easy delivery could be effected vaginally. There was no cause for anxiety at any time. But while waiting for these events, even without any effective uterine action, with none of the classical signs and symptoms so well described in textbooks as warning signs of an impending rupture, with not even a stretching of the lower uterine segment, the uteri gave way completely in the lower segment. An exactly similar picture was seen among patients in whom the lower segment scars gave way in labour.

The suggestion that this is due to mismanaged of labour cannot be accepted, as ruptures have occurred under careful supervision, and this cannot be attributed to grand multiparity as the parity ranged from 2 to 5. What then is the

cause? One has to postulate an inherent or acquired weakness of the uterine musculature which could be a part of general muscular weakness due possibly to malnutrition or protein deficiency which is very common with pregnant women here. This factor, though it cannot be proved, should be seriously considered as a possibility. In some of the ruptured uteri histologically studied, no abnormalities of structure could be made out.

It now behoves us to face this problem. Could it be that the integrity of a scar can be altered by the state of the patient's nutrition? Whatever be the type of section, however carefully the incision is sutured, whatever be its indication, however normal the postoperative period, the incidence of rupture of uterine scar will be high so long as malnutrition and lack of antenatal care persist. It will be much higher than that in countries where these problems do not exist. In the majority of cases it is not due to bad obstetrics or wrong judgment. We firmly believe that once a caesarean need not always be a repeat caesarean. It would indeed be wise to perform caesarean section only on patients in whom it could be proved that caesarean section was absolutely necessary. Since that cannot be done, it would indeed be wise to give very careful thought to the first caesarean section especially in areas where antenatal care is poor or not easily available.

Summary

1. Pregnancy and labour in 712 women after a previous caesarean section admitted into this hospital during 1953-1959 are reviewed.

2. The overall incidence of scar rupture after classical caesarean section was 5·6 per cent and after lower segment section 1·8 per cent. During labour in classical section it was 8·4 per cent and in lower segment section 2·3 per cent.

3. Elective caesarean section was done in 27·4 per cent of cases.

4. The incidence of successful vaginal delivery was 64·4 per cent.

5. The management of these cases in labour is discussed.

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TUBERCULOUS MENINGITIS IN CHILDREN

Analysis of 231 Cases

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Introduction

Prior to the introduction of streptomycin and INH, tuberculous meningitis was almost fatal. Today diagnosed and treated early, a good number of patients may be cured. Unfortunately the early symptoms may escape notice of even a very careful observer specially when medical supervision is meagre. When tuberculous meningitis presents symptoms like convulsions and unconsciousness which alarm the family sufficiently to seek medical aid, the diagnosis becomes obvious. On the other hand, in the absence of common neurological manifestations this condition is not usually thought of unless history of contact in the family, Mantoux test, x-ray examination, etc., point to its possibility.

In this country where tuberculosis is so prevalent, a large number of patients suffer from tuberculous meningitis as complication. During May 1957 to April 1960 (3 years), 5851 patients were admitted in the paediatric department of Medical College Hospital, Calcutta. Of these, 231 cases (4 per cent) were diagnosed as tuberculous meningitis. The idea of studying these cases was to find out the commonest and earliest manifestations of tuberculous meningitis, the common aetiological factors and the factors influencing the survival rate, etc.

Materials and Method

The study was undertaken in the paediatric department, Medical College Hospitals, Calcutta. 231 cases of tuberculous meningitis with various clinical manifestations were admitted during May 1957 to April 1960. The initial diagnosis was made from the history, clinical examination and the report of cerebrospinal fluid examination immediately after admission of the patients. Subsequently other investigations, such as Mantoux test, x-ray examination of chest, etc., were done. Too much importance on the finding of *M. tuberculosis* in cerebrospinal fluid was not given. The age incidence of patients ranged from neonatal period to 7 years.

Analysis

AETIOLOGY :

Age incidence—The age incidence is shown in Table 1.

Table 1—Showing Distribution of Patients According to Age

Age	No. of patients	Percentage
Up to 6 months ...	6	2·6
Above 6 months and up to 1 year	39	21·2
Above 1 and up to 2 years	80	34·62
Above 2 and up to 3 years	43	18·6
Above 3 and up to 4 years	30	13
Above 4 and up to 5 years	9	4
Above 5 and up to 6 years	8	3·45
Above 6 and up to 7 years	6	2·53

Incidence is very low up to the age of 6 months, after which there is a sharp rise reaching its peak between 1 and 2 years (34·62 per cent) and after the age of 4 years it comes to a very low level (4 per cent). About 75 per cent of cases occur within the first 3 years of age. The age incidence in this series though it differs to a great extent from that reported by other workers (Brain, 1955 ; Cocchi, 1956), agrees with that of Lincoln (1947) who showed a strikingly large number of cases between the 1st and 2nd birth day. In the present series the highest incidence was between 6 months and 2 years, while in others it was between 2 and 5 years.

Sex incidence—The sex incidence and its relative proportion will be evident from Table 2.

Table 2—Showing Incidence of Sex

Sex	No. of cases	Ratio
Male	140	1·54
Female	91	1

Males suffer about one and a half times more than the females. In this series 140 patients were males and 91 were females.

Seasonal incidence—Table 3 shows the relative occurrence of the disease in different seasons.

In this series roughly about 30 per cent of the cases occurred in spring and a second peak, not recorded by other workers, was noticeable during autumn.

Table 3—Showing No. of Cases in Relation to the Season of the Year

Month	1957	1958	1959	1960	Total	Percentage
January ...	—	5	4	6	15	6·4
February ...	—	4	5	9	18	7·7
March ...	—	6	3	7	16	6·94
April ...	—	5	5	5	15	6·4
May ...	10	9	4	—	23	9·9
June ...	8	12	4	—	24	10·38
July ...	9	6	10	—	25	11·16
August ...	6	6	5	—	17	7·36
September ...	6	6	4	—	16	6·94
October ...	8	12	4	—	24	10·38
November ...	6	9	7	—	22	9·5
December ...	6	7	3	—	16	6·94

Table 4—Showing No. of Cases by Religion

Religion	No. of cases	Percentage
Hindu	102	83·1
Muslim	34	14·8
Others	5	2·1

Religion—Table 4 shows the distribution of cases according to religion. A great majority of patients were Hindus. Only 34 paitents (14·8 per cent) out of 231 cases were Muslims. The remaining 5 cases were Christians and Chinese. Though the great majority of the patients were Hindus it is interesting to note that of the total of 351 Muslim patients admitted in the hospital from May 1957 to April 1960, 34 cases (10 per cent) were of tuberculous meningitis, whereas out of 5500 non-Muslim admissions, only 197 patients (3·6 per cent) suffered from the disease. This indicates a relatively higher incidence of the disease in Muslim patients.

Socio-economic condition—The majority of the cases came from very poor families where low nutritional state, overcrowding, ignorance and unhygienic standard of living, factors predisposing to tuberculous infections, were rampant.

Precipitating factors—The role of various infections as precipitating factors has very well been stressed by Herban and Asserson (1925) and Lincoln (1947). In this series it was found that during the 3 months prior to their admission into the hospital several patients suffered from illnesses like measles (8 cases), whooping cough (7 cases), typhoid fever (12 cases), pneumonia (6 cases), and infective hepatitis (2 cases). Some of the 'pneu-

monia' cases could well have been really cases of primary tuberculosis which, in course of three months, had developed into tuberculous meningitis. Twelve patients were having treatment for primary tuberculosis, four for 6 months, six for about 3 months and two for one month only.

Eleven patients gave history of fall from cot or bench within 5 to 6 days prior to admission. The role of this fall as a precipitating factor has not been properly stressed. Lincoln (*loc. cit.*) stressed that this fall might be a mere coincidence. However, in this series, in all the 11 patients with history of fall, the onset was almost sudden with fever, convulsion and vomiting. This sudden onset in patients with history of fall led us to suspect its possibility as a precipitating factor.

Associated diseases—Two cases had epilepsy. One was suffering from pheochromocytoma and died during the course of illness. This patient, aged 5 years, had high blood pressure (180/100 mm. of Hg). He also had pericardial effusion, and the catechol amine content of urine was 234 μg. One had tuberculous arthritis of the left elbow joint.

History of contact—Forty-two cases gave history of contact with persons suffering from pulmonary tuberculosis, constituting about 18 per cent of the total cases. This figure, however, does not reveal the true picture, because the party gave history only when a grossly infected case in the family was found to be undergoing treatment. It is possible that quite a number of such cases remained unrecognised for a long time in the family. This is probably the explanation of low incidence of contact in this series. The history of contact was, however, high (57 per cent) in Lincoln's (*loc. cit.*) series.

TABLE 5—SHOWING DURATION OF ILLNESS BEFORE ADMISSION

Duration (weeks)	No. of cases	Percentage
1	85	38·8
2	47	20·3
3	24	10·4
4	37	16
5 and above ...	38	16·5

Duration of illness before admission—Table 5 shows the number of patients with the duration of their illness prior to admission into the hospital. It will be found (q.v.) that prognosis of the disease varies to a certain extent upon the duration of illness before undergoing any treatment.

CLINICAL MANIFESTATION:

Onset—The usual mode of onset of tuberculous meningitis is gradual. In this series 206 cases (89·1 per cent) had insidious onset and in 25 cases (10·9 per cent) the onset was sudden.

Symptoms—Various symptoms are tabulated in the order of incidence (Table 6).

TABLE 6—SHOWING RELATIVE INCIDENCE OF DIFFERENT SYMPTOMS

Symptoms	No. of cases	Percentage
Fever	201	87
Anorexia	157	68
Vomiting	150	65
Irritability	148	64
Convulsion	145	62
Loss of weight	120	52
Unconsciousness ...	96	41
Constipation	69	30
Paralysis	39	17
Inability to walk ...	32	14
Stiffness of the body ...	26	11

It will be evident from Table 6 that the commonest symptoms in this group were irregular fever, anorexia, vomiting, irritability and convulsion. Vomiting was much more common after feed. Convulsion in most of the cases were generalised. Sudden onset of the disease with convulsion was more common in infants. Other symptoms like loss of weight, unconsciousness, constipation, paralysis, inability to walk and stiffness of the body were in the diminishing order. Unconsciousness was present in a fair number (41 per cent). Paralysis of one or the other limb was present in 39 cases (17 per cent), 7 cases had hemiplegia, and another 7 had hydrocephalus.

Signs—Incidence of important signs are shown in Table 7.

Cerebrospinal fluid—The results of examination of C.S.F. are shown in Table 8.

Lumbar puncture was done in all cases on admission. Low tension recorded in 20 cases was due to block in the subarachnoid space. Though characteristically the colour of the C.S.F. is clear in tuberculous meningitis, in our series 23 cases (10 per cent) showed hazy fluid and in 15 cases (6·5 per cent) it was xanthochromic. In a great majority (60 per cent) the cell count was within 100 per cmm., and the cells were mostly mononuclear. In 50 per cent of cases sugar content was below 20 mg. per cent and in 89·7 per cent cases chloride content was below 650 mg. per

TABLE 7—SHOWING INCIDENCE OF MAJOR SIGNS IN TUBERCULOUS MENINGITIS

Signs	No. of cases	Percentage
General condition :		
Poor	138	60
Fair	93	40
Anaemia	78	34·8
Neck rigidity (+) ...	125	54
Kernig's sign (+) ...	90	39
Neck rigidity, Kernig's sign :		
both negative ...	30	13
Pupils :		
Dilated	106	46
Constricted ...	30	13
Fontanelle (open in 48 cases) :		
Tense	34	71
Flat or depressed ...	14	29
Stiffness of the body ...	42	18
Opisthotonos	8	3·5
Hydrocephalus ...	7	3
Plantar response :		
Flexor	86	37
Extensor	62	27
Deep jerks exaggerated ...	40	17
Neck gland palpable ...	12	5
Liver palpable ...	64	27·3
Spleen palpable ...	21	9
Lungs with positive sign	62	26·8

TABLE 8—SHOWING CHARACTERISTICS OF C.S.F. ON ADMISSION

Character	No. of cases	Percentage
Colour :		
Clear	193	83·5
Hazy	23	10
Xanthochromic ...	15	6·5
Tension :		
High	192	83
Low	20	8·8
Normal	19	8·2
Cell count (/c.mm.) :		
Below 100	139	60·2
100 to 200	61	26
Above 200	31	13·8
Sugar content (per cent) :		
Below 20 mg. ...	116	50·3
20 to 40 mg. ...	96	41·5
Above 40 mg. ...	19	8·2
Chloride content (per cent) :		
Below 600 mg. ...	145	62·7
600 to 650 mg. ...	62	27
Above 650 mg. ...	24	10·3
Protein content (per cent) :		
Below 100 mg. ...	120	52
100 to 200 mg. ...	91	39·4
Above 200 mg. ...	20	8·6
Tubercle bacilli on smear	108	47
Cobweb formation ...	168	71

cent. Protein content was raised up to 100 mg. per cent in 52 per cent cases.

Tubercle bacilli could be demonstrated only in 47 per cent of cases as against 74 per cent reported by Voljavec (1959). Cocchi's (1956) figures are very near those of Voljavec (*loc. cit.*).

Skiagram of the chest—The sites of associated primary tuberculosis of the lungs are shown in Table 9.

TABLE 9—SHOWING ASSOCIATED PRIMARY TUBERCULOSIS OF THE LUNG

Site of lesion	No. of cases	Percentage
Lung field	38	21
Lung+mediastinal gland	44	24·5
Mediastinal gland ...	32	13·8
Negative finding ...	66	40·7
Total ...	180	

Skiagram of the chest was taken in 180 cases. In 66 cases (40·7 per cent), no evidence of tuberculosis was detected. In 59·3 per cent cases either the parenchymal lesion or the primary complex or the glandular component alone could be demonstrated, thereby proving the usual tendency (Lincoln, *loc. cit.*) of tuberculous meningitis to occur during the active stage of primary tuberculosis specially in children. Contrary to the finding of other workers (Fyfe, 1959 ; Lincoln, *loc. cit.* and others) the association of miliary tuberculosis and tuberculous meningitis was very low. Miliary tuberculosis is more commonly found in infants under 1 year of age. Only 2 cases in this series had miliary tuberculosis.

Mantoux test—It was carried out in all patients on admission. Patients under 3 years of age were given 1/1000 dilution and those above 3 years 1/10,000 dilution. The results were positive in 201 cases (87 per cent) which agree with figures reported by other workers (Lincoln, *loc. cit.*). 30 cases showed negative result. Most of these cases were very toxic and undernourished and acutely ill. None of the 231 patients had B.C.G. vaccination before.

Blood count—Total and differential counts were done in all cases. 188 patients (82 per cent) showed marked leucocytosis ranging from 12,000-20,000 per cmm. with a polymorphonuclear leucocytosis of 70-80 per cent.

TREATMENT :

Isoniazid because of its outstanding antimicrobial activity and easy diffusibility into the C.S.F. was given to all cases throughout the period of

treatment. On an average 10 mg./kg. body weight daily was given in two divided doses.

Streptomycin in a dose of 40 mg./kg. body weight was injected daily for 6 weeks and subsequently on alternate days for another 6 weeks. Still later, streptomycin was replaced by PAS in a daily dose of 250 mg./kg. body weight, in 4 divided doses.

In this series a small number of cases were treated with streptomycin and INH. only. The result did not differ in any way from those who were having three drugs at a time. In moderate and severe groups corticosteroids (prednisolone) were given in a dose of 15-20 mg. daily for 3 to 4 weeks.

SURVIVAL RATE :

The survival rate depends upon various factors, viz., stage of the disease, age of the patient, duration of illness before initiating treatment and drugs used for treatment.

TABLE 10—SHOWING INFLUENCE OF THE STAGE OF THE DISEASE OVER SURVIVAL RATE

Stage of the disease	No. of patients	Recovery	
		No.	Percentage
Mild ...	45	22	49
Moderate ...	90	24	26·6
Severe ...	96	19	19·8
Total ...	231	65	28·1

Our patients were classified into several stages in accordance with the classification of Medical Research Council (Great Britain). Mild cases denote patients who were completely conscious and had only mild focal neurological signs without any paralysis. Moderate cases were those who had slight disturbance of consciousness, with convulsion and neurological signs such as paralysis of various degrees. Severe cases were in coma with or without convulsion. Table 10 shows that most of our patients who were admitted into the hospital were advanced cases. There were only 45 mild cases. The percentage of recovery in mild group was 49, in moderate group 26·6 and in severe group 19·8. This low survival rate does not correspond with that reported by other workers, mostly because in addition to admission in late stages, the general condition of the patients and their nutritional status were very poor. The overall survival rate in this series was 28·1 per cent. Voljavec (1959) quoted the survival rate as 50 per cent and Lorber (1960) as 56 per cent.

Table 11 shows that in the author's series the survival rate is lowest in infants up to 2 years. The survival rate gradually increases with advancing age and in 4-7 years group it was found to be 80 per cent, thus confirming the findings of other workers (Cocchi, *loc. cit.* ; Lorber, 1960). In severe group, however, the age factor had very little influence. The survival rate in patients up to 2 years was 14·6 per cent, in the 2-4 years group 24 per cent, and in the 4-7 years group 23 per cent.

Percentage of survival rate depends to a certain extent, upon the duration of illness before initiation of treatment. From Table 12 it will be observed that the maximum number of patients came within 1 week of illness and they had a survival rate of 36·5 per cent. Patients with illness of 4 weeks' duration or more had the minimum survival rate 14 to 16 per pent.

Forty cases were treated with corticosteroid in addition to specific drugs. The survival rate in this group was 52·5 per cent, as against the overall survival rate of 28·1 per cent (Table 13).

30 per cent deaths was within 24 hours, 54 per cent within 72 hours, and 80·5 per cent within 1 week of admission to hospital. In fact, only 97 cases had a longer duration of treatment, and of them 65 survived. Table 14 shows the relation of survival rate with period of stay in hospital.

SUMMARY

231 cases of tuberculous meningitis are analysed with reference to their aetiological factors, clinical manifestations, treatment and prognosis in relation to the stage of the disease, age

TABLE 11—SHOWING RELATION OF SURVIVAL RATE WITH AGE

Stages	Up to 2 years			Above 2 and up to 4 years			Above 4 and up to 7 years		
	Total	Survived	Percentage	Total	Survived	Percentage	Total	Survived	Percentage
Mild ...	25	9	36	15	9	60	5	4	80
Moderate ...	54	12	22	25	8	32	11	4	36
Severe ...	41	6	14·6	42	10	24	13	3	23

TABLE 12—SHOWING RELATION OF DURATION OF ILLNESS BEFORE ADMISSION WITH SURVIVAL RATE

Duration of illness (in weeks)	No. of cases	No. of cases survived	Percentage
1 ...	85	31	36·5
2 ...	47	14	30
3 ...	24	9	37
4 ...	37	5	14
5 and above	38	6	16
Total ...	231	65	28·1

TABLE 13—SHOWING CORTICOSTEROID AND ITS EFFECT ON SURVIVAL RATE

Stage of the disease	No. of cases	No. of cases survived	Percentage
Mild ...	9	7	77·5
Moderate ...	20	11	55
Severe ...	11	3	27
Total ...	40	21	52·5

TABLE 14—SHOWING STAY IN HOSPITAL BEFORE DEATH

Duration of stay in hospital	No. of deaths	Percentage
24 hours	50	30
72 ,, ...	40	24
1 week	44	26·5
2 weeks and above ...	32	19·5
Total ...	166	

of the patient, duration of illness before treatment and the effect of corticosteroid. The highest age incidence is between 6 months and 2 years. Points of interest in this series are: Two seasonal peaks, one in spring and another in autumn; a higher incidence in Muslim patients in comparison to their overall admissions; possibility of a fall as a precipitating factor; the less frequent association of miliary tuberculosis; and the effect of corticosteroid in altering the prognosis favourably.

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EFFECT OF SUPPLEMENTATION ON THE NUTRITIVE VALUE OF RAMDANA SEED PROTEINS

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Mutual supplementation of food proteins is well known. A large volume of data is available on the effect of supplementation of different commonly consumed cereals such as wheat, rice, ragi, jowar and bajra and other plant or animal proteins. Such information with regard to some of the subsidiary cereal foods is limited. Among the latter, Ramdana (Amaranthus paniculatus—Rajkeerai in Tamil, Rajgira in Kannada) is fairly widely cultivated throughout India and is taken by the poorer sections of the population. The puffed seeds are mixed with syrup prepared from gur or sugar and flattened into 'patties' or rolled into round balls. It has a fairly high protein (14·0 per cent) and calcium (0·21 per cent) content which suggests its value as a nutritive article of diet.

The biological value of seed proteins has been determined by Subramanian and Srinivasan (1951) and Nutrition Research Laboratories, Coonoor (1957-58) using growth and nitrogen balance methods in albino rats. Kundaji and Rao (1954) have studied the supplementary relation of the seed proteins with rice and red gram, singly; and Nutrition Research Laboratories, Coonoor (*loc. cit.*) with Bengal gram plus amaranth.

In the present paper results of a supplementation study of ramdana proteins with sesame seed cake and dl-methionine and also of wheat with ramdana are reported.

Experimental Study

25 young albino rats of both sexes and between 35 to 52 g. initial weights were divided into five groups. They were housed in individual cages and were fed on diets providing 10 per cent protein from different protein sources. The composition of other ingredients added to the diets in different groups is shown in Table 1.

Weighed quantities of the diets were cooked in steam for 1 hour, and given to the rats *ad lib.* The residue left after each day's feeding was carefully collected, dried and weighed at the end of the experimental period. Animals were weighed once in a week for four weeks.

Results

Table 2 gives the protein efficiency ratio (P.E.R.) of ramdana proteins before and after supplementation with 0·2 per cent dl-methionine, til cake protein and also of wheat proteins before and after supplementation with ramdana protein.

It is apparent from Table 2 that the P.E.R. of ramdana was significantly raised by supplementation with either 0·2 per cent dl-methionine or with 3 per cent til cake protein. The P.E.R. of 8 per cent wheat protein supplemented with 2 per cent ramdana gave a lower value than the P.E.R. of either determined singly. The P.E.R. of ramdana alone according to Subramanian *et al* (1955) and N.R.L., Coonoor (*loc. cit.*) is 2·1 and 1·81 respectively. Our value (1·65) is somewhat lower than the above figures. Our P.E.R. value (1·60) of whole wheat flour is higher than that reported by Basu and Basak (1937).

Table 1—Showing Percentage Composition of Diets fed to Different Groups of Rats

Constituents of diets	Group I Ramdana alone	Group II Ramdana + 0·2% dl-methionine	Group II Ramdana (7% protein)+til cake (3% protein)	Group IV Wheat alone	Group V Wheat (8% protein)+ramdana (2% protein)
Starch (protein-free)	18·6	18·4	32·3	6·7	9·1
Ramdana	71·4	71·4	49·7	—	14·3
Wheat flour*	—	—	—	83·3	66·6
Til cake (powdered)†	—	—	8·0	—	—
Gingelly oil	5·0	5·0	5·0	5·0	5·0
Salt mixture (McCollum & Davis) ...	4·0	4·0	4·0	4·0	4·0
Vitamin mixture**	1·0	1·0	1·0	1·0	1·0
dl-methionine (Merck)	—	0·2	—	—	—
Protein content (N×6·25) determined by Kjeldahl's method	10·01	10·24	9·52	10·0	10·23

* Wheat flour containing 10 per cent protein was enriched by addition of wheat gluten so as to bring its final protein content to 12 per cent.

† Til cake was purchased locally from the market. It was powdered and seived and used without defatting. It had a protein content of 37·0 per cent.

** Composition of vitamin mixture was similar to that of Phansalkar *et al* (1957) except that no vitamin K was added. Vitamins A and D were provided through adexolin liquid (Glaxo).

Table 2—Showing P.E.R. of Ramdana Before and After Supplementation with 0·2 per cent Methionine and Til Cake Protein (Duration of Experiment—28 days)

Group No.	Source of protein	Protein (%)	No. of rats	Average initial weight (g.)	Average gain in weight (g)	P.E.R. Average	P.E.R. S.E.
I.	Ramdana (control)	10·01	5	51·6	25·2	1·65	0·062
II.	Ramdana+0·2% dl-methionine ...	10·24	6	36·6	49·3	1·97*	0·044
III.	Ramdana (7%)+til cake (3%) ...	9·52	5	50·2	36·0	2·11*	0·047
IV.	Wheat (control)	10·00	4	46·2	36·5	1·60	0·005
V.	Wheat (8%)+Ramdana (2%) ...	10·23	5	43·6	23·6	1·33	0·06

* 't' test shows statistically significant values as compared to the control.

Discussion

The efficiency of a protein is governed primarily by its pattern of essential amino acids. A high efficiency protein is one that gives, when fed to an animal or a human being, a relatively high yield of tissue protein as measured by growth (Flodin, 1958). Plant proteins as a class are considered inferior to animal proteins because of their poor digestibility and essential amino acid pattern. It is through proper supplementation that their nutritive value can be raised significantly. According to Flodin (*loc. cit.*) there are several methods of improving the protein efficiency, viz., (a) by supplementing a low efficiency protein with another protein whose amino acid is complementary so that each can tend to make up the other's deficiency ; (b) by adding synthetic amino acids to low efficiency proteins ; and (c) by using both protein supplements and amino acids simultaneously.

Knowledge of the essential amino acid pattern of a food protein becomes necessary to enable one to predict the limiting amino acid in each case. Such information reveals clearly the supplementary relations among proteins and affords a valuable guide in compounding the protein mixture of greatest efficiency in nutrition (Block and Mitchell, 1946).

By microbiological assay the proteins of ramdana have been found to contain a high proportion of lysine, which is almost equal to egg proteins, (Ramchandran and Phansalkar, 1956), although this could not be confirmed by using the technique of chromatography recommended by Subramanian *et al* (unpublished). Methionine is limited in ramdana to the extent of 40 per cent (Ramchandran and Phansalkar, *loc cit*). Since wheat proteins are known to be deficient in lysine (Mitchell and Smuts, 1932) it was of interest to see if supplementation of 8 per cent wheat protein with 2 per cent ramdana gave any favourable results. The results were, however, negative.

In order to supplement ramdana with a methionine-rich vegetable foodstuff, til cake was chosen because among plant protein sources til seeds have a very high methionine content (Grau and Almquist, 1945 ; Block and Bolling, 1951 ; Chang and Murray, 1949 ; Krishnamurthy *et al*, 1959 and 1960). It is a valuable supplement to plant proteins which are normally deficient in this amino acid (Kuppuswamy *et al*, 1958). Further, methionine in til proteins has been found to be completely available for chick growth (Grau and Almquist, *loc. cit.*). Almquist (1953) has reported that methionine contributed by sesame meal was equally active as synthetic methionine. Til cake is already finding application in correcting protein malnutrition in Central America (Kuppuswamy *et al, loc. cit.*). Supplementation of ramdana seed proteins with til cake protein was, therefore, expected to yield favourable results on theoretical grounds. This is also borne out by the results obtained above.

It is to be noticed that the overall growth of rats was more in those fed with ramdana plus dl-methionine (group II) than those fed with ramdana plus til cake (group III) although the P.E.R. of the latter was higher. The possible explanation is that rats in group II were younger than those in group III and secondly in group II methionine was provided in pure form whereas in group III the poorer digestibility of til cake might have rendered methionine not easily available. Til cake as marketed, generally contains much of husk, which is likely to hamper proper utilisation (Subrahmanian *et al*, 1955). Nevertheless results of supplementation with til cake are encouraging.

Summary

1. Supplementation of ramdana seed proteins (7 per cent) with til cake protein (3 per cent) is reported. Supplementation with dl-methionine or til cake protein resulted in enhanced growth of rats reared on ramdana alone.

2. Wheat proteins could not be supplemented with ramdana protein in the proportion of 8 : 2.

3. The implication of study of mutual supplementation is discussed.

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EXPERIENCE WITH NORADRENALINE IN SHOCK

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Pressor agents may prove life saving when other measures have failed to maintain perfusion of vital organs in a state of shock. In search of an ideal pressor agent, Goldenberg *et al* (1948) demonstrated the superiority of noradrenaline over others. Since then reports have appeared on its value in the treatment of shock after acute myocardial infarction (Smith and Guz, 1953 ; Miller *et al*, 1953 ; Livesay and Chapman, 1953 ; Malach and Rosenberg, 1960), in surgical operations (Churchill-Devidson *et al*, 1951) and other conditions. The present study was designed to assess the value of noradrenaline in shock met with in different medical conditions.

MATERIAL AND METHODS

53 cases presenting with shock unresponsive to other pressor agents and with a systolic blood pressure less than 70 mm. Hg formed the material for this study. These included 40 males and 13 females of age group varying from 3 to 74 years. Of these, 11 cases (20·9 per cent) were of cardiogenic shock due to acute myocardial infarction (7 cases), pulmonary embolism (3 cases) and other cause (1 case) ; 34 cases (64·1 per cent) were of oligaemic shock due to acute gastro-enteritis ; and the remaining 8 cases (15·2 per cent) had neurogenic shock.

Noradrenaline was administered intravenously by drip method with 5 per cent glucose solution in distilled water. The initial concentration of the drug in the infusion fluid varied from 4 to 8 μcg. (microgram) per ml. The concentration of the drug and the rate of infusion were regulated by blood pressure response. It was aimed at raising the systolic blood pressure to 100 mm. of Hg and maintaining it at that level, irrespective of the quantity of the drug required for this purpose. After the general condition improved the drug was gradually taken off.

Pulse, blood pressure and respiration were recorded before administration of the drug, and every 5 minutes for the first half an hour and then every half an hour after starting the noradrenaline infusion. A careful watch was kept on general condition, temperature, urinary output and development of pulmonary oedema.

The response to noradrenaline was recorded under the following headings : (a) satisfactory response, (b) no response. The satisfactory response was further graded into 4 types :

1. Blood pressure maintained after stoppage of the drug.
2. Fall in blood pressure after stopping the drug.
3. Development of refractoriness to further administration of the drug.
4. Satisfactory response associated with toxicity.

RESULTS

The results of noradrenaline administration in different types of shock are given in Table 1.

Of 11 cases of cardiogenic shock 6 cases (55·5 per cent) showed a satisfactory response but in none the response was of grade I and II. In 4 cases (36·3 per cent) initial satisfactory response was followed by development of refractoriness to the drug.

In the group of oligaemic shock 31 cases (91·2 per cent) showed a satisfactory response. Of these 15 cases (44·3 per cent) maintained blood pressure on discontinuation of the drug. In 2 cases (5·8 per cent) blood pressure dropped after the drug was taken off and in 11 cases (32·3 per cent) a state of refractoriness developed after an initial satisfactory response to noradrenaline.

In all the 8 cases of neurogenic shock response to noradrenaline was satisfactory. 37·5 per cent maintained the blood pressure after stoppage of the drug but in 25 per cent blood pressure came down after administration of the drug was withheld. Refractoriness to further administration of the drug was observed in 37·5 per cent.

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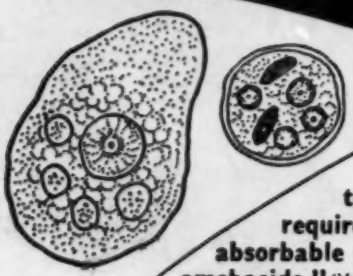

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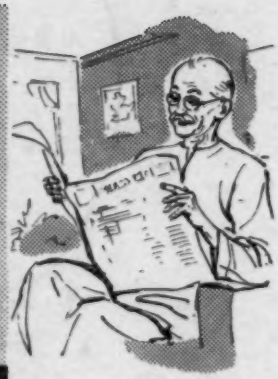

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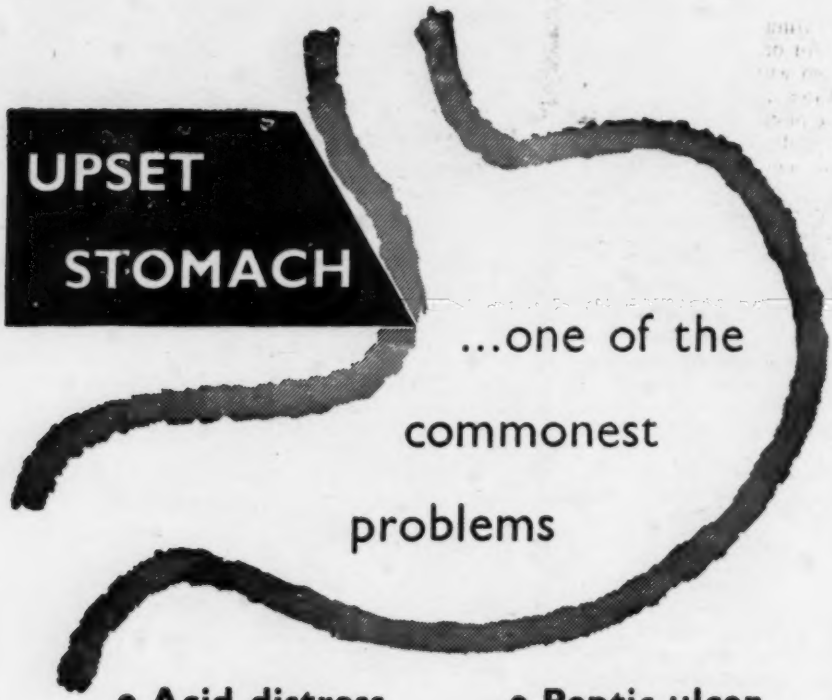

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TABLE 1—SHOWING CASES OF VARIOUS TYPES OF SHOCK AND THEIR RESPONSE TO NORADRENALINE

Type of shock	Satisfactory response										No response	
	Type 1		Type 2		Type 3		Type 4		Total			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Cardiogenic	—	—	—	—	4	36·3	2	19·2	6	55·5	5	45·5
Oligaemic	15	44·3	3	8·8	11	32·3	2	5·8	31	91·2	3	8·8
Neurogenic	3	37·5	2	25·0	3	37·5	—	—	8	100	—	—

No major side effects were seen during the noradrenaline administration. Four cases including 1 case of acute myocardial infarction developed premature beats. One of them also complained of 'sinking sensation' and restlessness and in one case blood pressure suddenly shot up. The latter case was previously hypertensive and had shock after acute myocardial infarction.

DISCUSSION

Noradrenaline increases peripheral resistance and raises the systolic and diastolic blood pressure without increasing the cardiac output (Goldenberg *et al*, 1948). It is a myocardial stimulant (Soyen *et al*, 1952) and has been found to increase the oxygen tension in the myocardium of dogs. This drug has been widely used in shock, particularly after myocardial infarction. Malach and Rosenberg (1960) in a review of 200 cases of shock following myocardial infarction, including their personal 20 cases, reported a significant degree of pressure response with noradrenaline in 45 to 100 per cent with an average of 75 per cent, whereas relief of shock was observed by them in 14 to 100 per cent with an average of 47 per cent.

In the present series, 55·5 per cent showed a satisfactory response to the administration of the drug but in none the blood pressure was maintained after stoppage of the noradrenaline administration. In contrast 91·2 per cent cases of oligaemic shock and all the cases of neurogenic shock responded to noradrenaline, and the blood pressure was maintained even after the drug was taken off in 44·3 per cent of the former, and 37·5 per cent of the latter. Although the poor results observed in cardiogenic shock may partly be due to late administration of the drug, yet the larger percentage of satisfactory response in oligaemic and neurogenic shock shows its superiority in these types of cases. Livesay and Chapman (1953) also found that the effect of noradrenaline was more encouraging in cases with non-cardiogenic shock.

Toxicity—Noradrenaline appears to be a safe drug for administration and devoid of major toxic effects. 92·5 per cent in the present series had no undesirable side effects.

However, development of cardiac arrhythmias with administration of noradrenaline has posed a problem particularly in cases of myocardial infarction (Littler and Mckendrick, 1957). Malach and Rosenberg (1960) found 9 cases of cardiac arrhythmias in a total of 52 cases. In the present series premature beats were noted in 4 of the 53 cases, an incidence of 7·5 per cent. Littler and Mckendrick (1957) hold that noradrenaline has an irritative effect on the myocardium.

Hypertensive individuals are believed to run a risk of showing hypersensitivity to noradrenaline. Sudden shooting of blood pressure in a case with high blood pressure before the development of shock, due to myocardial infarction, lends support to the above view.

Impairement of renal function can be expected after noradrenaline administration since the drug reduces the renal blood flow by virtue of its vasoconstrictive effect. The urinary output remained unaffected in the present study. Moyer *et al* (1953) maintain that effect of renal vasoconstriction is more than compensated by increase in the pressure head produced by noradrenaline.

The final position of noradrenaline in the management of shock is something like that of ACTH. It helps to tide over the crisis, but when shock has lasted long and caused irreparable damage or the primary disease has already exhausted the patient the drug becomes useless. Nevertheless, it is of immense value in many situations.

SUMMARY

A study of noradrenaline in 53 cases of shock due to diverse causes and unresponsive to other pressor agents has been reported.

Noradrenaline has been found to be more useful in oligaemic and neurogenic varieties of shock.

The drug has been found to be free from serious toxic effects. Premature beats were observed in 7·5 per cent and one instance of sudden rise of blood pressure has been recorded in a previously hypertensive patient.

ACKNOWLEDGMENTS

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SPECIAL ARTICLES

PROBLEM OF SECONDARY AMENORRHOEA

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Irregularities of menstruation are common complaints encountered in gynaecological practice. It is not a disease but a symptom of some underlying organic or functional disorder. When menstruation fails to occur by the seventeenth year of life the condition may be defined as primary amenorrhoea. Menstruation once established and then followed by cessation for a period of three months or more can be defined as true secondary amenorrhoea. Oligomenorrhoea is a convenient term applied to long interval type of menstrual cycle in which the cycle is prolonged from forty days to three months. The term hypomenorrhoea suggests only scanty flow where menstrual cycle is normal. Menstruation occurring in a cycle of 24 to 39 days may be considered within physiological limit.

Oligomenorrhoea and hypomenorrhoea are usually precursors of secondary amenorrhoea, especially when associated with endocrine disorders and systemic diseases. Hence, they should be considered along with secondary amenorrhoea, from the point of view of diagnosis. Failure of ovulation, impaired fertility and spontaneous abortion are more common with these types of cases, than with normally menstruating women.

Anterior pituitary gland secretes gonad stimulating hormone, which in turn is influenced by hypothalamus. Follicle stimulating hormone stimulates the production of oestrogens and luteinising hormone stimulates the production of progestin. Oestrogen and progestin in cyclic order allow proper proliferation and secretory growth of endometrium and produce ovulation. These hormones prepare the endometrium for the nidation of the fertilised ovum. In absence of pregnancy, the cyclic withdrawal of these hormones produces menstruation, the so called 'weeping' of the non-pregnant uterus. The ovarian hormones when in excess, inhibit the production of the stimulating hormones of the pituitary. Absence of ovarian hormones allows the pituitary to produce follicle stimulating hormone in excess. This is in short the pituitary-ovarian-uterine axis of menstrual cycle.

Two other endocrine glands, viz., the thyroid and the adrenal, indirectly influence the menstrual cycle. Considered from the physiological point of view, secondary amenorrhoea of shorter or longer duration invariably appears after the first menstruation and before the menopause. There is cessation of menstruation during pregnancy and for a variable period during lactation. In each case the possibility of pregnancy should always be kept in mind and should be ruled out by repeated examinations, hormonal withdrawal bleeding test and by animal experiments.

In our study of the case histories of 400 primiparas, 42 per cent of cases had their first menstruation within three months after delivery, even though 80 per cent of the subjects had their babies artificially fed. In the remaining cases menstruation reappeared within three to five months after delivery. Women with menstrual irregularities during early lactation period approach gynaecologist for fear of pregnancy. In such cases if oestrogen with progestin is injected on two consecutive days menstruation starts within 8 to 10 days of injection in the absence of pregnancy. Irregu-

* Based on a paper read before the Poona Medical Congress held in June 1960.

larities and inconsistency of menstrual cycle during lactation period is not uncommon, but is often frightening to the patient who is particularly keen on 'family planning' and at the same time very keen on resuming the sex life in early lactation period.

Pathology of Secondary Amenorrhoea

The functional disturbances in Froehlich's syndrome, the pituitary adenomas causing acromegaly and Cushing's disease and the destructive lesion of pituitary in Simmond's disease produce secondary amenorrhoea with other characteristic changes in the individual. The well-known but rare condition of Sheehan's syndrome following obstetrical shock or severe postpartum haemorrhage, produces cachexia, genital atrophy and amenorrhoea.

The role of thyroid gland is uncertain. In thyrotoxicosis and hypothyroidism menstrual irregularities are common but not constant. In our series of twelve cases of toxic goitre, all females, only two suffered from secondary amenorrhoea, four were menorrhagic and the remaining six had normal periods. The irregularity in each case was restored with control of thyrotoxicosis. Eight cases of proved hypothyroidism had low B.M.R., obesity and hypo- or oligomenorrhoea, and were treated with substitution therapy of thyroid and oestrogen. In the subclinical type associated with obesity and hypomenorrhoea thyroid extracts were given empirically with satisfactory results.

Ovarian factor—Surgical removal or x-ray irradiation of the ovaries causes secondary amenorrhoea which needs no treatment. Masculinising ovarian tumours, like arrhenoblastomas produce secondary amenorrhoea which is amenable to surgical treatment. Persistent corpusluteum producing amenorrhoea even in the absence of pregnancy is a doubtful entity. A well-known but an uncommon condition like Stein-Leventhal syndrome, characterised by obesity, amenorrhoea, hirsutism and sterility, is also associated with bilateral enlarged polycystic ovaries, a condition which is treated satisfactorily with wedge resection of both the ovaries.

Hyperplasia of adrenal cortex and Cushing's syndrome produce marked endocrine disturbances characterised by hypertrichosis, virilism, enlargement of clitoris, atrophy of uterus and amenorrhoea. There are certain changes in the blood biochemistry. Evaluation of urinary 17-ketosteroids is of great value in the diagnosis and assessment of the endocrine pathology. In cases of Addison's disease amenorrhoea is a common complaint.

Uterine factor—Surgical removal of the uterus or radium irradiation of the endometrium, gives rise to expected secondary amenorrhoea. The obstruction at the cervix, following the neglected type of cauterisation, plastic repair of the genital tract and obstructing tumours may give rise to cryptomenorrhoea, which can be relieved by surgery. Radical chemical treatment of endometrium and severe postabortal endometritis, injudicious and repeated curettage give rise to secondary amenorrhoea. Out of six cases two belonged to the category of multiple curettage with loss of basal endometrium, and four gave history suggestive of induced criminal septic abortions. In no case the treatment for amenorrhoea was successful.

Tuberculous endometritis gives rise to oligohypomenorrhoea in most cases and respond well to antituberculous therapy. Many debilitating diseases like tuberculosis, give rise to secondary amenorrhoea. Out of 32 cases of abdominal tuberculosis, without involvement of genital organs, only 6 had normal menstruation, 20 suffered from hypomenorrhoea and remaining 6 had secondary amenorrhoea. Of six cases with tuberculous tubo-ovarian masses without endometrial involvement, four had oligomenorrhoea and two normal menstrual cycle.

Malnutrition gives rise to secondary amenorrhoea. Prisoners of war on starvation diet and cases of anorexia nervosa are wellknown examples.

Psychological factor—Emotional and mental disturbances play a great part much more frequently than had been previously expected. Shock, fright, worry, sexual disturbances, change of work, climate and environmental changes are familiar examples. Short periods of amenorrhoea is quite a common complaint with women who have an intense longing for pregnancy or are afraid of it. Depressive mood, physical depletion and motor underactivity are conducive to amenorrhoea. Expansive elated mood without motor activity, suffering form agitation and worry predispose to profuse and prolonged periods.

The following cases illustrate how psychological disturbances produce menstrual irregularities.

Case Reports

Case 1—A lady aged 26 years suffered from oligohypomenorrhoea of eight months' duration. Physical examination and investigations were normal. Usual therapy failed to correct the cycle. The patient was originally a resident of the Punjab. Whenever she went back to her home town in the Punjab, and stayed with her mother, the menstrual cycles were normal, without any medication.

Case 2—A lady aged 29 years suffered from amenorrhoea for eight months. She used to have three regular periods in summer season only. There was history of two medically induced abortions. She was treated in different towns with curettage, gonadotropin and ovarian hormones for nearly two years and had regular withdrawal bleeding periods during the course of treatment only. On examination and investigation no positive defect could be detected. She was advised to discontinue all medications for at least two years. At the second interview the possibility of a psychological factor was suspected. She denied any type of social, mental or sexual disharmony. After a year she came back to tell the story of her expected divorce. She could not adjust with the social behaviour and philosophy of life of her husband. She also revealed that since she took this decision her menstrual cycle got corrected without any medication. From the past history and the present decision, one could make out that the irregularity started since after her marriage, and the so-called suspected pregnancies were not real ones.

Case 3—A lady having only two children lost her younger child in an accident. Since then she had amenorrhoea for one and a half year. She did not respond to any hormonal therapy. During a personal interview later, it was found that she had given her consent under pressure, for her husband's sterilisation. For nearly one year since this operation, she suffered from hypomenorrhoea and after the accidental death of her child she suffered from amenorrhoea. Her husband was operated to remedy the sterilisation (of course with no results). Within a few months of this operatios the lady started menstruating again.

Case 4—A lady aged 34 years with secondary sterility came under observation for oligomenorrhoea of one year's duration. Physical examination and investigation proved normal. Substitution hormonal therapy caused withdrawal bleeding for four months. Later she suffered from amenorrhoea for eight months and did not respond to proper and adequate hormone therapy. One day she came back with profuse bleeding. Surprisingly that day coincided with the day when she got the news that she could stay with her husband, her husband having secured a residential block in Bombay. The irregularity started two years ago when she realised that she could not stay with her husband for a year or two.

Diagnosis

A thorough search for the cause of secondary amenorrhoea calls for a correct and detailed history taking. A pelvic examination is indispensable and a general physical check up with special attention to endocrine stigmas may give the final answer. Determination of pregnancy with available tests, is essential. Basal body temperature charts and endometrial biopsy will reveal hormonal influence, ovulation and uterine tuberculous infection. In suspected cases of intracranial tumours, x-ray examination of skull may exclude its presence. Estimation of urinary 17-ketosteroids may help in assessing the influence of the adrenal cortex. B.M.R. studies may reveal the thyroid disturbances. Study of hormonal levels in blood is a very scientific procedure but is at present impracticable for general usage, because of its cost, technical falacies and lack of laboratory facilities. We have not done any hormonal studies in any of our cases.

Therapeutic tests are very simple. Administration of progestin alone in large doses should produce withdrawal bleeding only when the uterine endometrium has been previously primed with sufficient oestrin suggesting the deficiency of progestin only. If the test fails to produce the desired effect, the cyclic administration of oestrin and progestin should be tried. Appearance of withdrawal bleeding will suggest an intact and healthy endometrium. If it does not cause bleeding then the uterus is nonresponsive and is concerned in secondary amenorrhoea. Withdrawal bleeding not only suggests the presence of healthy endometrium but also indicates the hypofunction of the ovaries. Administration of anterior pituitary hormones like antex-physex, gestyl-pregnyl or antuitrin S, and synapoidin will cause withdrawal bleeding thereby suggesting the defect in the pituitary itself or the hypothalamus. Absence of bleeding will suggest nonfunctioning of the ovaries.

Prognosis

Prognosis of secondary amenorrhoea is less favourable in the following cases:

1. Amenorrhoea of more than one year's duration.
2. Patients over 35 years of age.
3. Atrophic endometrium.
4. Presence of large doses of gonadotropins in the blood.

In the cases of systemic and pelvic diseases and in definite endocrinopathies the prognosis depends on the course of termination of the underlying disease.

Treatment

In the treatment of the functional type of secondary amenorrhoea substitution hormonal therapy has been tried with various combinations, dosage and routes of administration by various

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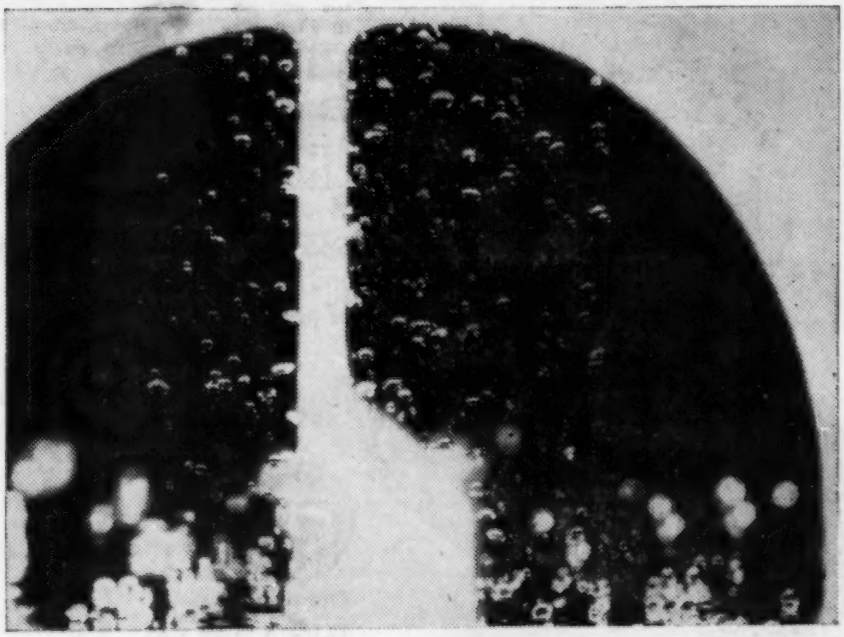

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workers. The following is the method followed by the author:

(A) *Amenorrhoea of longer duration (six months or more)*—Progynon depot, 10 mg., 4 intramuscular injections at intevals of 5 days, followed by proluton depot, 125 mg., on 15th and 20th days in cyclic repetition. This treatment is repeated for three months.

(B) *Amenorrhoea of 3 to 6 months' duration*—Two injections of progynon depot at 5 days' interval, followed by (1) two injections of proluton depot at 5 days interval; and (2) tablets of estroid forte, 1 tablet daily for 20 days, starting from 3rd to the 23rd day of each monthly cycle. The regime is combined with one injection of uniprogestin on alternate days (five injections), starting on the 15th day of each monthly cycle.

(C) *Amenorrhoea of shorter duration (less than 3 months)*—One injection of estroprogyn is given on alternate days (three injections). After the onset of menstruation, estroin is given, one tablet daily for 20 days, followed from 15th day onward by 5 injections of uniprogestin, one on alternate days.

Gonadotropins were tried on ten cases only. It was found effective on two cases. The following are the disadvantages of gonadotropins: (1) costly preparation; (2) antigonadotropic substances are likely to be formed in the blood and may give rise to allergic reactions (two of the author's cases had similar reaction); (3) none of the available gonadotropins are similar to those circulating in the human blood; hence, the results are often disappointing.

X-ray irradiation of pituitary and ovaries is done in cases of functional amenorrhoea, where the fault lies with these glands. The author had so far no personal experience about this therapy, but had seen as many as three cases subjected to this therapy. Only one had responded well and now she is due for confinement.

Summary

The problem of secondary amenorrhoea requires detailed study in each and every individual case and the treatment should be directed towards treatment of the cause. The results are disappointing in late and long standing cases and will not be so encouraging, in functional disorders till human gonadotropins are available for general use. The role of psychosomatic disorders need better recognition and proper attention.

A FOLLOW-UP STUDY OF SUSPICIOUS CASES OF LEPROSY UNDER OBSERVATION

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It is not at all difficult to diagnose a well-established case of leprosy as in all cases—one of the three cardinal signs of leprosy is usually present, if not all, i.e., loss of sensation with or without a macule, thickening of peripheral cutaneous nerve and the presence of acid-fast bacillus. In the majority of leprosy cases, diagnosis is made with the help of the first two clinical cardinal signs and rarely bacteriological laboratory examination is necessary. Moreover in India, majority of the cases (over 75 per cent) are non-infectious. Diagnosis of leprosy, therefore, entirely depends upon the findings made from clinical observation. But there are a good number of cases in which the clinical findings are dubious in nature or missing in part or not clear cut and these cases constitute a dilemma in diagnosis. It is rather difficult to dispose of these cases as no definite sign of leprosy is present or because of the doubtful nature of the clinical manifestation. It has been observed that a few of these cases developed definite signs of leprosy in course of time. These problem cases, therefore, should be kept under observation for a prolonged period and asked to report for re-examination at intervals of 3 months till a final decision has been made.

During the period of 4 years from 1956 to 1959, 17,118 patients reported at the Leprosy Research Department of School of Tropical Medicine, Calcutta, for diagnosis. Of these, 14,093 patients were diagnosed as cases of leprosy, 867 patients (Table 1) were kept under observation, and the rest were disposed of as otherwise. The patients who were kept under observation showed suspicious signs of the disease. Of the 867 cases under observation, 307 showed in most of the cases a single hypopigmented patch with vague sensory disturbances (doubtful superficial anaesthesia and analgesia) or loss of hair or loss of sweat over the lesion. Slightly thickened erythematous lesions

were found in 295 cases and 164 cases showed neurological symptoms such as tingling, burning sensation, numbness over certain areas of skin of a limb, neuralgic pain along the distribution of some peripheral nerves but without any macule over the skin. The remaining 101 cases showed either eczematous lesion, scar, healed up skin lesion simulating leprous lesion, drug dermatitis or ulcer but in none of this group the disease developed.

As house to house survey is not possible in outpatients department, one had to depend on the patient's attendance regularly or irregularly every third month or so. Of the 867 cases under observation, 451 attended once or more than once and the rest did not turn up for re-examination at all. 195 cases (Table 1) are still under observation.

Out of 155 cases under observation (where final decision had been made either with hypopigmented or erythematous patches or sensory changes observed for a period ranging from 3 to 24 months), 94 developed definite signs of leprosy and 61 did not and were therefore discharged as not suffering from leprosy.

Sixtyone patients showed some suspicious sign (Table 2) at the time of first examination. Hypopigmented patches were later diagnosed as leucoderma, or healed up other skin diseases and the erythematous patches were diagnosed as seborrheic dermatitis or other skin disease. But the cases with sensory changes were mostly diagnosed as neuritis of non-leprous origin, i.e., Bernhardt-Roth syndrome. The remaining 94 cases (Table 2), which at the time of initial examination in the out-patient department showed doubtful manifestation of the disease with negative bacteriological finding, developed definite sign of leprosy at the initial lesion as the disease was allowed to progress for a few months. From Table 2 it is evident that all, excepting four, of the 94 cases developed into non-lepromatous type of leprosy. The type distribution of 94 cases was as follows: Maculo-anaesthetic 25 (2 with polyneuritic change); tuberculoid 63 (2 with polyneuritic change); primary polyneuritic 2; indeterminate (with polyneuritic change) 1 (bacteriologically negative); borderline 2 (one with polyneuritic change). Of the total of 63 cases with hypopigmented patches, 22 developed

TABLE 1—SHOWING YEARLY DISTRIBUTION OF CASES UNDER OBSERVATION IN RELATION TO TOTAL ATTENDANCE

Years	Total attendance	Leprosy cases	Observation cases	Hypopigmented lesion initially	Erythematous lesion initially	Sensory changes initially	Other symptoms initially	Observation cases still under surveillance
1956	4,334	3,650	189	63	82	25	19	62
1957	4,342	3,622	228	73	81	41	33	41
1958	4,234	3,451	215	86	60	55	14	43
1959	4,208	3,370	235	85	72	43	35	44
1956-59	17,118	14,093	867	307	295	164	101	195

TABLE 2—SHOWING AN ANALYSIS OF THE 94 OUT OF 155 OBSERVATION CASES WHICH LATER DEVELOPED DEFINITE SIGNS OF LEPROSY

Initial sign	Total No.	Non-lepromatous						Intermediate			Lepromatous	No sign of leprosy
		MA_1	MA_1P_1	MA_2P_1	T_1	T_1P_2	P_1	B_1	B_2P_1	I_2P_2	L_1	
Hypopigmented ...	63	16	—	1	22	—	—	—	1	1	1	21
Erythematous ...	64	1	—	—	34	2	—	1	—	—	—	26
Sensory ...	28	6	1	—	5	—	2	—	—	—	—	14
Total ...	155	23	1	1	61	2	2	1	1	1	1	61

MA=maculo-anaesthetic; T=tuberculoid; P=polyneuritic; I=indeterminate; B=borderline; L=lepromatous; 1=single lesion; 2=multiple lesions.

into tuberculoid type, 17 developed into maculo-anaesthetic type, 2 developed into intermediate form, one developed into lepromatous type, and the remaining 21 showed no sign of leprosy. It appears that though hypopigmented patch looks benign in character it may develop into malignant infectious form. Of the 64 cases with erythematous patch, only one became flat and developed into maculo-anaesthetic, 36 cases developed into tuberculoid, one into borderline and the remaining 26 cases showed no sign of leprosy. Of the 28 cases with sensory changes, 7 developed into maculo-anaesthetic, 5 cases into tuberculoid, 2 into pure primary polyneuritic and the remaining 14 cases did not show any sign of leprosy.

Definite sign of leprosy was found to develop in all the 94 cases at the initial lesion. In 6 cases, however, in addition to above, definite sign was also observed over a few secondary lesions. In about 50 per cent of the cases, definite sign was found after an observation period of 3 months. This study brings out the importance of keeping suspicious cases under observation, which may be prolonged in a few cases.

ACKNOWLEDGMENT

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DISTRIBUTION OF RENAL STONES IN THE CALYCES

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The present study was undertaken to find out the distribution of renal stones in the various calyces of the kidney, and to see if there was any special predilection for any calyx. During 1959 and 1960 a total of 27,892 patients were investigated in the radiology department of the All-India Institute of Medical Sciences, New Delhi. 1,828 patients were referred for examination of the kidney, ureter and bladder areas for urinary complaints, of which 1,136 patients were declared normal on plain x-ray examination and 220 had in addition intravenous pyelograms taken to exclude radiolucent stones or any other abnormalities. The remaining 692 patients showed abnormalities on plain skiagrams and intravenous pyeograms, or on intravenous pyelograms alone. 10 showed doubtful opaque shadows on plain skiagram but stones were excluded on intravenous pyelography. Only 682 patients showed abnormalities. 476 patients had urinary stones, mainly radio-opaque, and some of them showed translucent stones also. In some multiple stones were found. The total number of stones seen in the urinary tract in these 476 patients were 529. 206 cases showed anomalies other than stones. The distribution of the stones is shown in Table 1.

TABLE 1—SHOWING DISTRIBUTION OF STONES IN THE URINARY TRACT

Site of stone	No. of stones
Kidney	
Right	129
Left	105
Ureter	
Right	103
Left	116
Urinary bladder	72
Urethra	4

The sex distribution is rather striking for all urinary stones seen in this series, males preponderating over the females by more than 5 : 1 ratio. There were 403 males, and 73 females.

The highest percentage of patients suffering from urinary tract stones were in the 20-49 years age group—the highest number (112) being in 30-39 years group (Table 2).

TABLE 2—SHOWING DISTRIBUTION OF PATIENTS WITH URINARY STONES ACCORDING TO AGE

Age (years)	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79
No. of patients	29	38	108	112	94	57	30	8

Skiagrams of 100 patients with renal stones were selected at random and reviewed in an effort to find out the common sites of renal stones whether in the calyces or in the pelvis, and if in the calyces, whether there was any special predilection for any particular calyx.

In 100 cases of renal stones, 131 stones were found. Their distribution according to site is given in Table 3.

TABLE 3—SHOWING DISTRIBUTION OF 131 RENAL STONES BY SITE IN 100 CASES

Site of stone	No. of stones
Pelvis of kidney	67
Calyces	
Superior	5
Middle	8
Inferior	48
In hydronephrotic sac or renal parenchyma	3

DISCUSSION

Stones in the urinary tract are among the common complaints. Difference in sex distribution is striking though the figures quoted by different authors vary. According to Winsbury-White (1954) the ratio between male and female patients with urinary tract stones is 2·2 : 1. We found a higher preponderance of males over females, i.e., 403 : 73 or roughly 5·5 : 1. This may be due to the higher attendance of males in the various outpatients departments. The same author found the average age for stone formation as 44·9 years, or the beginning of the 5th decade, though the urinary stones are found in all ages. Higgins (1954) found the highest number of cases in the 3rd and 4th decades. In our series, the highest number of cases belonged to 30-39 years age group ; though 20-29 years and 40-49 years age groups followed closely.

It is well known that in the renal area majority of the stones come to lie in the pelvis of the kidney. Winsbury-White (*loc. cit.*) found about 80 per cent of the renal stones in the pelvis of the kidney. In some cases one or more stones were found in the calyces also. The next commonest site of the renal stones was in the inferior group of calyces.

Of 131 renal stones in our series of 100 patients, 67 (51·1 per cent) were found in the pelvis of the kidney. Out of 61 stones of the calyx, the highest number, i.e., 45 (74 per cent) was found in the inferior calyces. Stewart (1953) also found that of calculi of the calyx, about 75 per cent matures in the lower pole of the kidney. The primary calculus may originate in the lower pole and mature there, or on the other hand, it may form elsewhere in the kidney and drop by gravity into one of the calyces of the lower pole, where it matures. Moreover, secondary stones, due to immobilisation, infection and stasis, are also most commonly found in this lowest stump which offers the least efficient drainage of any part of the system (Riches, 1959). In older conservative operations of pyelolithotomy and nephrolithotomy no attempt was made, as a rule, to correct any underlying factor which might in part be responsible for the maturation of the calculi. After these operations, the probability that further stones will form is considerable. The usual recurrence rate of 15-45 per cent is thus to be expected (Stewart, 1953). In partial nephrectomy, the 'nest' or the calyx in which these stones have matured is excised and in this way the pathological calyx and adjacent renal tissue with debris and stones are removed, so that the recurrence rate is lower. Stewart (*loc. cit.*) found recurrence rate of 6·8 per cent in 87 kidneys which were followed up by skiagraphy after partial nephrectomy for a period of 2-13 years.

SUMMARY

Patients x-rayed for urinary complaints over a period of 2 years are reviewed and incidence of stones found in the various calyces noted. Since stones occur very frequently in the inferior group of calyces and recurrence also occurs very commonly in the lower pole of the kidney, operation of partial nephrectomy has an important place in the surgery of renal stones.

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CASE NOTE

MILROY'S DISEASE

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BRIEF REVIEW OF LITERATURE

An account of this disease was first given by Milroy (1892) as "an undescribed variety of hereditary oedema". He reviewed the original family and found only two new cases amongst 30 siblings descending from the original patient. Later Meige (1900) described this disease as *trophoedema chronique hereditaire*. It can be

found in isolated cases and also in several members of a family. Hope and French (1907-08) and Meige (*loc. cit.*) observed it even in five generations.

The disease is characterised by a hard, painless oedema which appears usually on one or both legs and shows a slow progression (Spiegel, *loc. cit.*). This idiopathic hereditary lymphoedema may have its onset either at birth or at any time between childhood and early adulthood (Panos and Texas, 1956). Certain authors (Aird, 1935; Allen *et al*, 1946) insist that eponymous 'Milroy's disease' should be restricted to those cases who have congenital origin, whereas Bloom (1941) sees no need for undue emphasis on the age at which the oedema appears, as the clinical picture is otherwise essentially identical. Milroy (1928) himself in the 35 years follow-up report of the family he originally described, indicates that the age of appearance of oedema varies. Meige (*loc. cit.*) stresses the segmental arrangements which were not observed, however, by all other authors. The oedema is usually confined to the feet or legs, sometimes to the upper extremities (Radner; Schroeder and Helweg Larsen, cited by Dencker and Gottfries, 1954). The trunk and the face are rarely, if ever, involved. The extremities usually differ from one another in the degree of involvement.

Some authors (Hope and French, *loc. cit.*); Stern, 1942) have reported acute attacks with fever, sudden swelling, erythema and tenderness of the affected area.

The aetiology of this disease is obscure. Inspite of numerous genealogic studies with this disorder, basic genetic patterns have not yet been actually delineated.

Homans, Drinker and Field (1934) studied their cases with dye (trypan blue) and exploratory operations. They commented, "A malformation or varicosity of lymphatics may be present. Yet, there is no actual evidence in support of this conception of varicose lymphatics and it is rather more likely that there is an incomplete development of the lymphatics in such cases".

Servelle and Deyssen (1951) studied patients similarly by injections of radio-opaque dyes. They found dilated and incompetent lymphatics and postulated a block in the region of the femoral canal because the dye was not seen above the thigh.

Studies of Kinmonth and Taylor (1954) revealed evidences in favour of the existence of larger, dilated, incompetent lymphatics in the limbs of patients with lymphoedema. Tissue fluid analysis and tracer studies with 'marked protein' have confirmed that the lymphatic circulation is extremely sluggish in the swollen areas. No obstruction to lymphatic vessels has ever been found. A temporary obstruction to the outflow of the lymph from the limb may cause a persistent dilatation and incompetence of lymph trunk.

Case Report

A male farmer, aged 17 years, was admitted on 23rd December 1960 in the medical ward of Karnatak Medical College Hospital, Hubli, with complaints of swelling of both feet and legs since birth and pain in the abdomen for 15 days. Oedema of both feet and lower two-thirds of the legs was more or less constant. There was no pain nor redness in the oedematous area. Pain in the abdomen was localised to epigastric and umbilical regions. It was of a dull character and had no radiation or relation to meals. History of intestinal helminthiasis, vomiting and fever was absent.

Past and personal history was essentially noncontributory. The patient had no varicose veins and he denied any history of venereal disease. He was unmarried.

Family history revealed that out of 21 members in 3 generations, 8 had oedema of feet and legs since birth. Total involvement of males and females in these generations was 6 and 2 out of 14 and 7 respectively (Fig. 1). Members of the

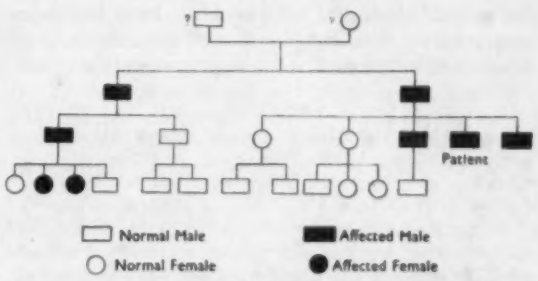

FIG. 1—SHOWING THE INCIDENCE OF MILROY'S DISEASE IN THREE GENERATIONS OF THE PATIENT

family could not remember whether the patient's grandfather and grandmother had any oedema of legs. There was no other history of familial and hereditary disorders.

Physical examination revealed that the patient was anaemic. There was no lymphadenopathy. Throat, tongue, teeth and ears were normal. Neck veins were not visible. Conjunctiva and nails were pale. In the upper extremities there was no oedema while it was present in both feet and lower two-thirds of legs. The oedema was partially pitting in character and was maximum on the dorsum of each foot at its middle where the skin was also pigmented and thickened. There was no tenderness nor any erythema.

Systemic examinations revealed nothing abnormal. Heart was normal. There was no tenderness in the abdomen. Liver and spleen were not palpable. No mass was felt in the abdomen. Other systems were normal.

INVESTIGATIONS :

Haemoglobin was 6 g. per cent and R.B.C. 1·8 million/c.mm. Total W.B.C. count was 5,700/c.mm. with neutrophils 70 per cent,

lymphocytes 26 per cent, eosinophils 3 per cent and monocyte 1 per cent. Urine did not contain any albumin and was microscopically normal. Stool showed hookworm and roundworm ova. Night blood for filaria was negative on three occasions. Total blood protein was 5·13 g. per cent with albumin 2·85 g. per cent and globulin 2·28 g. per cent. Blood cholesterol and blood urea were within normal limits. X-ray examination of the pelvis revealed nothing abnormal.

TREATMENT :

The patient was in the hospital for about a month and was treated for ankylostomiasis, anaemia and ascariasis. He passed a few roundworms. Anaemia improved with intravenous iron and treatment on general lines. Raising of legs did not influence the oedema while local bandages temporarily diminished it. Improvement of anaemia also did not show any appreciable effect.

Discussion

In all these eight cases in three generations, oedema was present since birth. Two types are known clinically (Dencker and Gottfries, 1954)—a congenital form and a slow insidious form which usually appears at puberty.

In early stages the disease can hardly be distinguished from other types of soft pitting oedema, but fibrosis gradually develops and the affected area becomes firm and hard. Hypertrophied tissues do not pit on pressure. In the presented case oedema was of a partially pitting character and the skin was thick and rough. Other causes of oedema were excluded. Blood protein level was moderately reduced due to anaemia. After improvement of anaemia, oedema persisted up to the same extent as it was before. Familial and hereditary histories and commencement of the oedema since birth confirmed the diagnosis of Milroy's disease. General state of health in this case was not disturbed. as was noticed by some workers (Dencker and Gottfries, *loc. cit.*; Panos and Texas, *loc. cit.*). Acute attacks of swelling, pain, tenderness and redness in the oedematous legs with fever were not present. This was reported in some cases by Hope and French (*loc. cit.*). Such attacks perhaps are considered to have certain common characteristics with the manifestations of various collagen disease (Panos and Texas, *loc. cit.*). Female cases having similar attacks were reported by Dencker and Gottfries (*loc. cit.*) and by Panos and Texas (*loc. cit.*). The former found its relation to menarche and allergy while the latter attributed it to apparent specific precipitating factors like insect bites, and minor traumas. All of them, however, noticed premenstrual increase in oedema. This, perhaps, favours the hypothesis of endocrinal imbalance as to the cause of oedema in Milroy's disease.

Oedema in the case of Dencker and Gottfries (*loc. cit.*) receded remarkably with cortisone and reappeared promptly after discontinuation of the therapy. Panos and Texas (*loc. cit.*) reported complete subsidence of acute inflammatory episodes during treatment, in their female case. In our case we could not try cortisone adequately. However this opens up a new line of treatment for cases of Milroy's disease specially with acute attacks.

In the case above reported, local elastic bandages, however, temporarily diminished the oedema. Raising of legs had no effect. Other lines of treatment carried out in the past, viz., mercurial diuretics (Stern, *loc. cit.*), and sympathectomy (Dencker and Gottfries, *loc. cit.*) were not tried as previous authors did not claim any success with them. Moreover, Bjorkman (cited by Dencker and Gottfries, *loc. cit.*) considered that mercurials were contra-indicated in such cases. Local surgical interference has been applied in severe cases (Kinmonth, 1954; Kinmonth and Taylor, *loc. cit.*). Here, repeated operations are frequently necessary and great disfigurement usually occurs.

Summary

Out of 8 cases of Milroy's disease in three generations one case is reported and the literature is briefly reviewed.

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JOURNAL OF THE
INDIAN MEDICAL ASSOCIATION

CALCUTTA, OCTOBER 1, 1961

PROBLEM OF TROPICAL EOSINOPHILIA

Over forty years ago, Roy and Basu[1] recognised in Calcutta a type of asthma associated with marked eosinophilia responding to arsenic (soamin) injection and alkalies by mouth, while Ghosh[2] put emphasis on the fact that cases in which there was no eosinophilia did not improve with soamin. Since then the condition has been reported by various workers mostly from India under different names, including 'tropical eosinophilia' given by Weingarten[3]. Frimodt-Moller and Barton[4] and Chaudhuri[5, 6] thought that the condition might be the result of an allergic response to some antigen. The apparently specific effect of arsenic and piperazine compound points to an infective agent being the antigen, and there are evidences in support of this. van der Sar and Hartz[7] reported presence of microfilaria in the gland biopsy in patients with massive eosinophilia, though none was seen in their peripheral blood. In some areas of Africa, infestation by filarial worm, *Acanthocheilonema perstans,* was shown to cause eosinophilia of 70 per cent or more[8]. In Ceylon, D'Abrera[9] noted that the distribution of tropical eosinophilia cases corresponded with that of Bancroftian filariasis, although experiences in some non-filarious areas of India have not been the same[10]. Malhotra[11] however reported a few cases of filariasis in which the syndrome was observed, while Ganatra and Lewis[12] and Chaudhuri[13] observed efficacy of diethylcarbamazine (hetrazan), a filaricidal drug in this disease. Incidentally, it is now the drug of choice in treatment. The possibility of aetiological relationship to the dog filarid, *Dirofilaria immitis,* was shown for the first time by Chaudhuri[14] by demonstrating in the patients with no microfilaria in their blood positive cutaneous tests with *Dirofilaria* antigen. Danaraj *et al,*[15] subsequently showed filarial complement-fixation test, applied to the patient's sera using this antigen, positive before and negative or of low titre after treatment. Buckley[16, 17] observed that inoculation with infective filarial larvae from mosquitoes fed on domestic cat carrying a natural infection with Malayan species of *Wuchereiria pahangi* resulted in the appearance of the signs and symptoms of the disease in man. Webb *et al*[18] observed a number of cases in which microfilaria though not found in the blood were demonstrated in the lungs, liver and lymph nodes.

A careful clinical study of 167 cases by Chaudhuri[13] revealed that evidences of pulmonary disease were merely frequent but not invariably present. Not all patients improved uniformly with treatment ; some with clinical cures continued to have 'mottlings' in the x-ray films of the chest, some had enlarged lymph nodes and two had microfilaria in the blood. As many as seven out of 120 typical cases of tropical eosinophilia not responding to the drug were reported by Saha and Sen[19]. These facts suggest that related or unrelated conditions may result from other agents or parasites.

Over 30 years ago Chandler[20], while working at the Calcutta School of Tropical Medicine, had drawn attention to early development of *Toxocara canis,* the common roundworm of dogs, including invasion of lungs in man. Beaver *et al*[21] recognised the clinical condition known as visceral larva migrans due to ingestion of infective larvae. Smith and Beaver[22] observed high eosinophilia without lung symptoms in children fed with its eggs, while Dent *et al*[23] reported a case with generalised infection and hypereosinophilia in a child known to be a 'dirt eater.' Nichols[24] observed that *T. canis* larvae in the

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experimental mouse are morphologically identical with those in human infection.

The experimental studies of Chaudhuri and Saha[25] are of interest. They fed a series of guinea-pigs with embryonated eggs of dog ascarid, causing not only marked eosinophilia but also respiratory distress and radiological mottling in some of those animals. They had also studied the effect of the same infection in a human volunteer who after a feed on these eggs showed a striking eosinophilic response and subsequently developed respiratory symptoms depicting the clinical picture of tropical eosinophilia. Diethylcarbamazine did not influence the condition produced in animals[26].

Both *Dirofilaria* and *Toxocara* are natural parasites of dogs and/or cats, but they can readily infect man. Their life cycles are, however, not completed within the human host, but the larvae may survive in the viscera or disintegrate acting as a foreign protein, giving rise to an 'allergic' state with hypereosinophilia, tissue infiltrations with eosinophils and granuloma formations. The method of exposure of man to species of *Dirofilaria* is not clear, but the cycle perhaps involves an insect vector, viz., a mosquito which inoculates the infective stage into the human host. Migratory larvae of other parasites have also been incriminated, viz., *Necator americanus*[9], and *A. lumbricoides*[27]. In fact, Löffler's syndrome[28] was attributed to migration of ascaris larvae in the lung with an allergic reaction. Other parasites, viz., Trichuris and Strongyloids often lead to high eosinophilia as well. The symptoms may be absent, indefinite or variable according to the species and the number and localisation of the larvae besides host-response.

Elsewhere in this issue appears an article based on the aetiopathology of the disease including the experimental studies referred to above and the report of a patient in whom biopsy of the lung was done. This is of particular importance because of the very limited observations on the pathological changes in the lung obviously due to the benign nature of the disease and consequently lack of postmortem material. The pathology appears to be of the nature of eosinophilic bronchiolitis and pneumonitis irregularly distributed in both lungs. A striking feature is the presence of nodular granulomatous lesions with or without a foreign body (possibly parasitic) or a necrotic tissue in the centre surrounded by a cluster of cells including giant cells and a peripheral zone of eosinophils. The histological changes observed in this case resemble closely those seen in the experimental animals. They obviously account for the radiological appearances in the lung field.

Thus the various observations readily allow themselves to be interpreted in favour of the parasitic aetiology of tropical eosinophilia. The tissue change may be due to zooparasites, and domestic animals like dog and cat may be the source of infection. Filariasis has been mostly incriminated but as previously mentioned other parasites may also play a role. The presence of markedly increased eosinophils not only in the peripheral blood but also in the bone-marrow, liver, lung and sputum, bronchial spasm and tissue infiltration suggests a general body response. Non-pulmonary form of the disease is also encountered[29]. Abdominal symptoms, viz., vague pain or discomfort with or without hepatic involvement may be the only or predominant clinical feature in some cases and may even be relieved by treatment indicating that antigen-antibody reaction may affect more than one organ and not confined to the lung only. Drug sensitivity of the parasite determines the result of treatment with diethylcarbamazine and organic arsenic. Although these drugs appear to act specifically, cases failing to respond to one or either of them are not rare. Relapses or reinfections are not uncommon, but they are usually amenable to treatment.

We conclude by saying that the disease, apparently resulting from parasitic infection possibly of non-human source, has been subjected to various investigations by different workers and a considerable amount of knowledge has been accumulated from extensive studies—clinical, experimental, epidemiological, immunological and therapeutic, yet there are many lacunae in this knowledge. Most cases are readily diagnosed and easily treated, yet the factors that control the incidence and spread are not precisely known. The condition, though occasionally mistaken for hypereosinophilia due to other causes, fairly dominates the practice of the clinician in the tropics, yet nobody knows how 'eosinophilia' does begin ; it is often first detected either by chance at a routine examination or because of the symptoms which take him to a doctor. Fortunately we happened to know the 'cure' before the cause of this disease, yet there are intricate problems for research.

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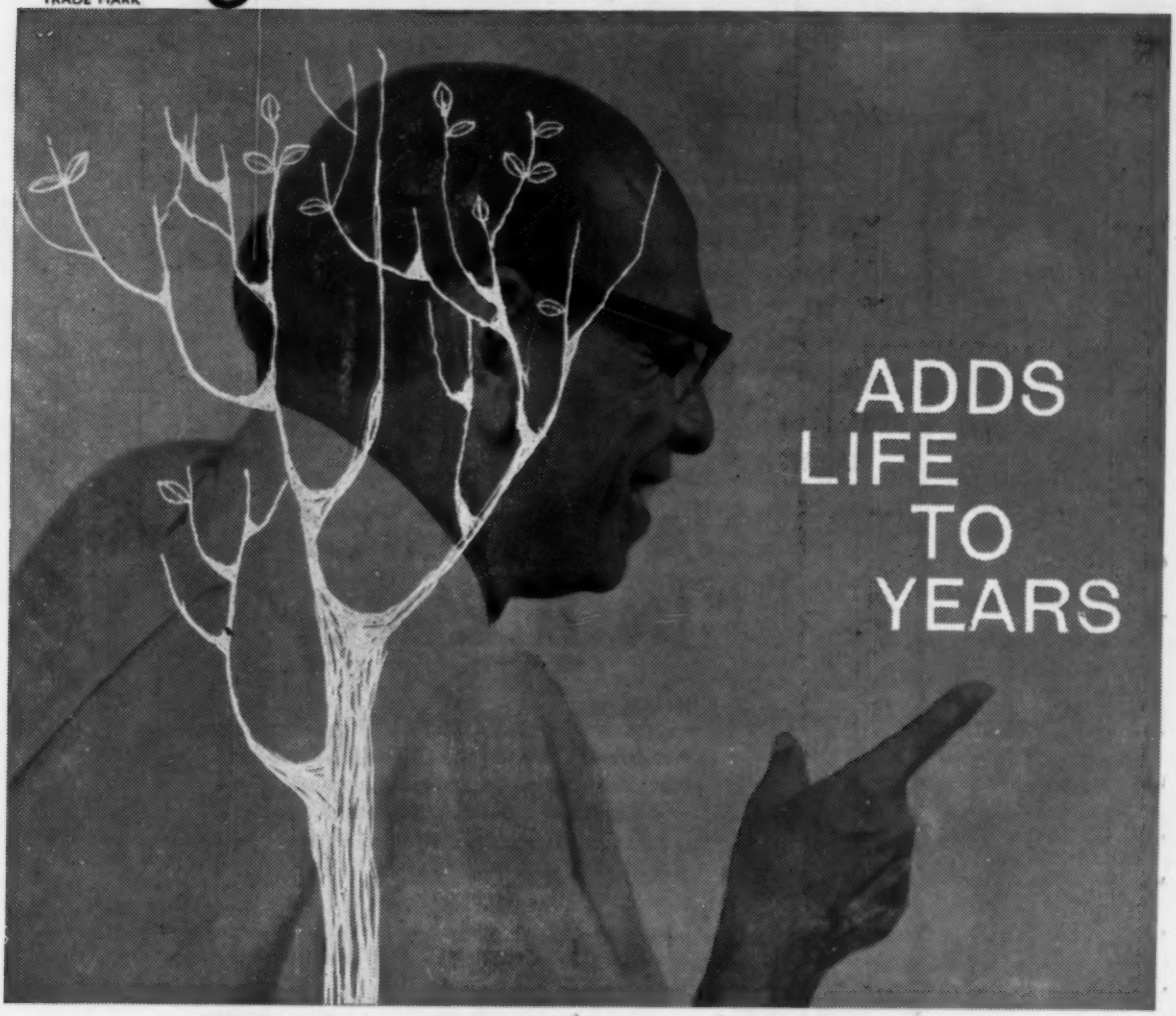

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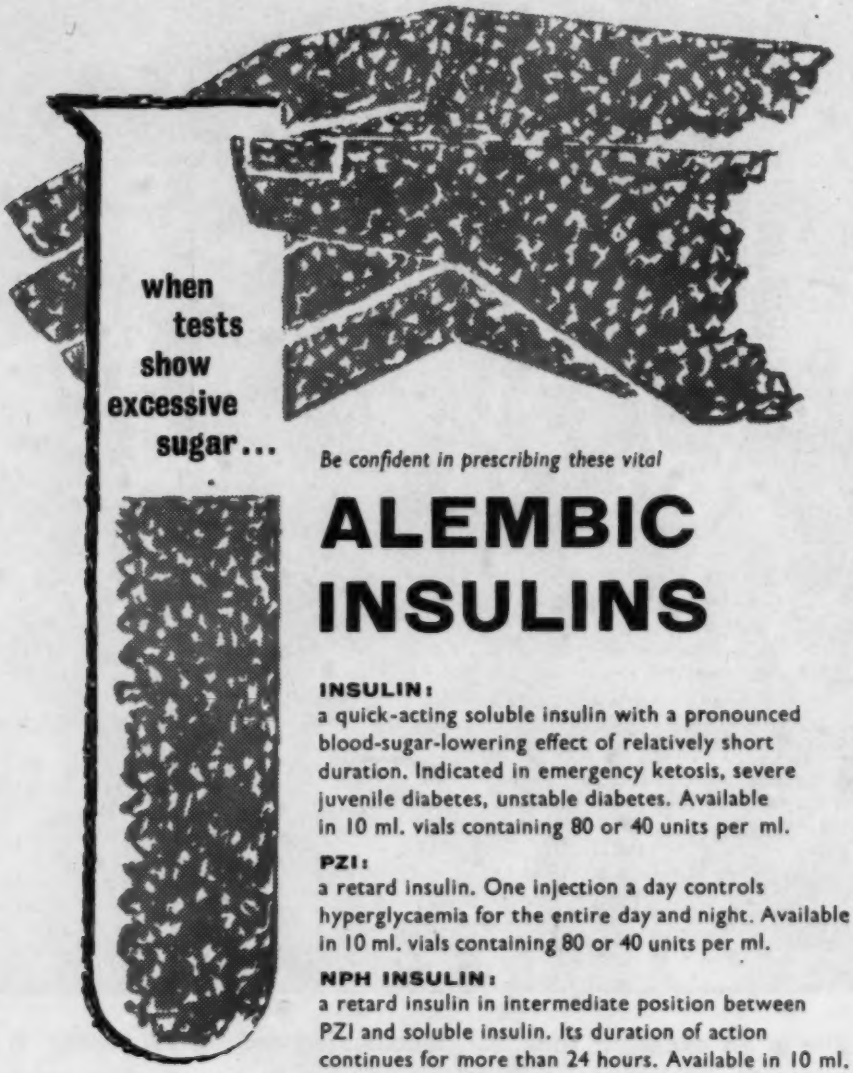

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GENERAL PRACTICE DIGEST

NON-EMERGENCY TREATMENT OF DIABETES MELLITUS

A relative or absolute deficiency of insulin in diabetes mellitus causes a diminished utilisation of glucose by body cells, and as a consequence the blood glucose level increases (hyperglycaema). The kidney tubules not able to reabsorb such a high concentration of glucose from the glomerular filtrate, will spill glucose in the urine (glycosuria).

In such a patient, the regulations of diet and medication can be determined in two ways: (1) by repeated examination of blood sugar, and (2) by the glucose content of the urine. Repeated blood sugar determination is expensive, inconvenient, uncomfortable and time-consuming. Glucose determination in urine is easier to carry out and, if executed correctly, is superior.

Renal threshold is occasionally high in elderly diabetics with arteriosclerosis, hypertension and chronic nephritis. When they have complications like gangrene or infections, blood sugar determination is necessary.

Joslin recommends testing the urine on arising and retiring, as well as before lunch and before dinner. Nelson recommends four specimens a day at 7 to 8 A.M., 11-30 A.M. to 12 NOON, 5 to 6 P.M. and 7 to 9 P.M. He estimates the insulin dosage from qualitative determinations. Cecil and Loeb recommend collecting all urine excreted during four consecutive periods extending over 24 hours. They advise that the specimen voided before each meal be included in the next collection.

THE METHOD OF FOUR SAMPLES:

The urine should be collected by the patient as follows:

1. *The morning urine* (8 A.M. to 12 NOON) occasionally contains glucose from the breakfast. It should contain all urine voided in the morning, and should not contain the urine voided on arising or before the pre-breakfast injection or before breakfast. This morning period is terminated by emptying the bladder before lunch.

2. The *afternoon urine* (12 NOON to 6 P.M.) occasionally contains glucose from the lunch. It should contain all urine voided in the afternoon, including the urine passed just before dinner.

3. The *evening urine* (6 P.M. to 11 P.M.) occasionally contains all urine voided during the evening. This evening period is terminated by emptying the bladder just before retiring.

4. The *night urine* (11 P.M. to 8 A.M.) should contain all urine passed during the night to which the specimen voided just before breakfast is added.

The patient should measure the quantity of urine contained in each of the four portions. The amount of spilled reducing substance in each separate period should be determined.

An editorial in the *Lancet* observed that "there seems now to be good reasons to use the lente-preparations for all new cases of diabetes requiring insulin, so that globulin-insulin, protamine-zinc-insulin and N.P.H. insulin should gradually fall into disuse as new generations of diabetics grow up."

LENTE INSULIN:

The reasons for popularity of lente insulins are as follows:

1. The onset of effect of protamine-zinc-insulin is too slow (two hours), and its action too prolonged (30-36 hours). Globin insulin and N.P.H. insulin are intermediate insulins. Their time of action is too short (16-20 hours).

2. Oral antidiabetic drugs are relatively ineffective in the younger age group. In the 30 to 40 year age group 70 per cent are primary failures. Between the ages of 40 and 50, 50 per cent are primary failures. Between the ages of 50 and 60, 40 per cent are primary failures.

3. It has been found that with tolbutamide the rate of secondary failure in drug response was 29·5 per cent. The monthly rate of secondary failure averaged about 3 per cent of patients treated each month. Thus at this rate of secondary failure, all patients would eventually become resistant to tolbutamide. Once a patient fails to respond to the drug, the failure is permanent.

4. Oral hypoglycaemic drugs are contraindicated in ketosis, precoma, diabetic coma, acute infectious conditions, trauma, operations, in pregnancy and in liver and kidney diseases.

5. Cases of severe hepatic damage after tolbutamide have recently been reported. The biguanides cause gastrointestinal side effects in many cases.

6. Oral hypoglycaemic drugs are ineffective in the absence of functioning beta-cells of the islands of Langerhans.

The dosage of insulin recommended should be adjusted according to the patient's individual response. Factors determining the individual reaction are age, endogenous insulin production, nutritional state, emotional state, physical activity, etc.

The onset, maximum effect and duration of action of lente insulin and other insulins are shown below:

Type of insulin	Onset	Maximum effect	Duration of action
Regular ...	20 minutes	3- 4 hours	6- 8 hours
Semi-lente ...	30 ,,	6- 8 ,,	12-14 ,,
Lente ...	45-60 ,,	8-10 ,,	14-20 ,,
Ultra-lente ...	2 hours	16-20 ,,	24-30 ,,

Lente insulin is a mixture of 30 per cent semi-lente insulin and 70 per cent ultra-lente insulin.

GLUCOSE-EQUIVALENTS:

This term is defined as "the amount of glucose in grams metabolised from the urine by the administration of one unit of insulin", i.e., the amount in grams of glucose broken down to CO_2 and H_2O.

In mild diabetics the glucose-equivalent is 2½ to 3, which decreases as the severity of the diabetic state

increases. In infectious diseases and in acidosis the glucose-equivalent is less than 1. In coma it may drop to 1/10.

The following are the possibilities :

1. The non-overweight diabetic with only the standard diet of 1,500 calories (150 g. carbohydrate, 68 g. fat and 72 g. protein) who spills less than 30 g. of glucose without acetonuria on the 4th to 6th day, requires an amount of 1/3 n* units of lente insulin before breakfast. This also applies to the obese diabetic, who follows a 'standard diet' modified by a low fat content. In the above two instances the glucose-equivalent is 3, if the diabetic spills n g. of glucose in 24 hours. In the mild diabetic, especially in the obese, aglycosuria can be achieved solely by a dietary regime.

2. In the diabetic who is on a standard diet, spilling between 30 and 60 g. of glucose, and also a small amount of acetone in the 3rd to 4th day, ½ n units of lente insulin should be given. Here the glucose-equivalent, being 2, is less favourable.

3. A diabetic who spills more than 60 g. of glucose and has definite acetonuria or diacetic acid in the urine should receive on the first day in units of regular insulin an amount equal to one-half to three-fourths of the amount of grams of carbohydrates in his diet. This amount will be more than 40 units of regular insulin, which should be given divided into 2 or 3 injections, i.e., before meals and if necessary before retiring. In addition, the carbohydrates in the standard diet should be increased by 100 to 200 g. for suppressing the ketosis. The diet should not be ketogenic, i.e., low in fat and protein.

The lente insulins are contraindicated in the treatment of precoma and diabetic coma. Regular insulins should be used in such cases. Sometimes it is possible to continue the lente insulins and to give additional regular insulin whenever the glucose-equivalent drops during acute infections, trauma or operations.

The onset of lente insulin is slow; the breakfast should, therefore, be taken one hour after the injection. The breakfast should be low in carbohydrates (20 to 30 g.). The carbohydrates of the lunch should vary between 40 and 50 g.

SHIFTING INSULIN DOSES :

1. If all the four portions after lente insulin are positive, the dose should be increased.
2. If all the four portions after lente insulin are negative, the dose should be diminished.
3. If one or more portions are negative, then
   (a) If only the *morning* urine shows glycosuria after the lente insulin, the ratio of semi-lente to ultra-lente (30 : 70) may be changed by increasing the semi-lente component; or adding some semi-lente to the lente insulin.
   (b) If the *after*noon portion contains glucose after lente insulin, some of the carbohydrates from lunch may be shifted to breakfast, or alternatively, the ratio of semi-lente to ultra-lente may be changed by increasing semi-lente.
   (c) If the *evening or night* urine shows glycosuria after lente insulin, the ratio of semi-lente to ultra-lente may be changed by increasing the ultra-lente to the lente insulin.

The amount of carbohydrate of the meal preceding the glycosuria may be decreased by shifting some of these carbohydrates to another meal, which is followed by a period of glycosuria. It is also possible to make the urine glucose-free in all the four samples by decreasing the amount of all carbohydrates. The occurrence of glycosuria in the morning urine (8 to 10 A.M. and 10 A.M. to 12 NOON) indicates the period for which the pre-breakfast injection has failed. For example,

(i) If 8-10 A.M. sample is negative, there is possibly an overlapping effect of the ultra-lente component.
(ii) If 10 A.M. to 12 NOON sample is strongly positive, the onset of effect of the semi-lente was probably too slow.
(iii) If the 8 to 10 A.M. sample is positive, an insufficient amount of ultra-lente may have been given.
(iv) If the 10 A.M. to 12 NOON sample is negative (and sometimes, associated with hypoglycaemic symptoms), too much semi-lente may have been given.
(v) If there is hypoglycaemia in the afternoon, the ratio of semi-lente to ultra-lente may be changed by decreasing the semi-lente. Shifting some of the carbohydrates may also prevent hypoglycaemia.

Stubborn morning glycosuria may be prevented by giving regular insulin and lente insulin. (The regular insulin (pH 2·5-·3·5) should be drawn into the syringe first, and the lente insulin (pH 7·2) following. If lente insulin is drawn first followed by regular insulin, the bulb of regular insulin would receive traces of the alkaline lente insulin, with the formation of insulin crystals —converting regular insulin into long-acting insulin).

The advantages of the lente insulin are the following :

1. A high percentage of diabetics can be regulated effectively with one injection a day.

2. Semi-lente, ultra-lente and lente insulin do not contain foreign protein. Hence local or general allergic reactions are less frequently seen.

Warning symptoms of impending hypoglycaemia—No insulin, particularly the long acting insulin, should be prescribed for a patient, without explaining the symptoms of beginning hypoglycaemia. These symptoms are : "jitters", sudden perspiration, palpitations, hot flushes, anxiety, restlessness, pseudo-inebriation, aggresiveness, double vision, and difficulty in speaking.

The patient must be cautioned to check each new vial of insulin to see if it is 40 units per ml. or 80 units per ml. This will prevent unexpected hypoglycaemia.

The physician should insist on the patient carrying at least 5 (five) lumps of sugar at all times, in order to suppress the first symptoms of an impending hypoglycaemia.

—From an article by J. H. Verhave—
Rocky Mt. M. J., **58** : 26, 1961.

* 'n'=the amount of glucose in g. spilled into the urine in 24 hours.

CURRENT MEDICAL LITERATURE

Chronic Subdural Haematoma in Adolescence and Early Adulthood

RAHME, R. S. AND GREEN, D. (*J.A.M.A.*, **176**: 424, 1961) from the Department of Neurology, State University of Iowa, University Hospitals, write:

Chronic subdural haematoma in adolescence and early adulthood occurs more frequently than is commonly believed. Usually it is stated that the condition is rare between the ages of 5 and 40 years. The inclusion of subdural haematoma as part of the differential diagnosis in this age group is often neglected. This point has not been specifically emphasised in textbooks or papers on the subject.

The records of all patients with this condition at the University Hospitals between 1938 and 1960 were reviewed. Eighty patients with chronic subdural haematoma were studied; of these 15 were between the ages of 5 and 40 years (19 per cent). Our purpose in this report has been to emphasise the importance of the relative frequency of the condition in a specific age group.

Carpal Tunnel Syndrome

GROSSMAN, L. A., KAPLAN, H. J., OWNBY, F. D., AND GROSSMAN, M. (*J.A.M.A.*, **176**: 259, 1961) from the Department of Medicine, Vanderbilt University School of Medicine, write:

Median nerve neuritis resulting from nerve compression within the carpal tunnel was seen in 3 patients. The underlying disorders were rheumatoid arthritis, gout, and multiple myeloma. Surgical decompression of the median nerve was successful in relieving the pain in each instance. Symptoms referable to the median neuropathy preceded all other manifestations of systemic disease in the patients with rheumatoid arthritis and multiple myeloma.

Gallstone Intestinal Obstruction

KIRKLAND, K. C. AND CROCE, R. J. (*J.A.M.A.*, **176**: 494, 1961) from Surgical Service, Worcester City Hospital in giving a review of the literature on the subject and in presenting 12 cases including 3 of recurrence observe:

One hundred and forty-five cases of gallstone obstruction of the bowel occurring since 1940 are reviewed and 12 cases of gallstone obstruction, of which 3 are recurrent, are reported. It was found that nearly 70 per cent of patients with this disease are in the 60-80 years of age group. The sex ratio was found to be 12 females to 1 male. Sixty per cent of cases reviewed were found to have a history compatible with, or suggestive of, gallbladder disease. In the cases reviewed an accurate preoperative diagnosis was made in only 35 per cent, except in those cases reported from this hospital, in which the correct preoperative diagnosis was made in 83 per cent. The most frequent site of obstruction remains the ileum, where 66 per cent of gallstone impactions take place. The over-all mortality rate is 26 per cent, whereas in our series it was 16 per cent. Wound sepsis still remains a common sequela of surgery for gallstone intestinal obstruction.

The incidence of this type of obstruction will decline as more and earlier surgery for gallbladder disease is performed. Age, sex, site of obstruction and wound sepsis rates remain much the same as they have been in the past.

Accuracy of diagnosis preoperatively is more frequent now than formerly but is still not being made with sufficient frequency. Mortality rates in this disease are dropping but can be further improved by increasing awareness of the condition, plus earlier preoperative diagnosis and surgery.

Limitations of Medical Care Attributable to Medical Education

MCKEOWN, T. (*Lancet*, **2**: 1, 1961) in an address given at the Eighth Teaching Institute of the Association of American Medical Colleges at Hollywood Beach, Florida, on November 2, 1960, concludes as follows:

Irrespective of the way in which they are financed, the contemporary medical services are characterised by (a) separation of responsibility for the mentally ill, the chronic sick, and the acutely ill, and (b) a public-health service devoted exclusively to the prevention of disease. Responsibility is divided in this way because each class of patients presented to society at different times and as different problems; and the character of the public-health service is attributable to its development in a period when the outstanding challenge was infectious disease. Both features are unsuited to the main problems which medicine will face in future. These are: prenatal mortality; mental illness; and sickness and disability associated with ageing.

Improvement of the pattern of practice will require changes in medical education. At present the patients admitted to teaching hospitals are highly selected. This selection was traditional in voluntary hospitals and has been thought to be consistent with the requirements of scientific medicine. It has three serious disadvantages: it gives medical students a false impression of the medical task and of the methods appropriate to it; it prevents many of the ablest people from contributing to thought about the way in which medicine is to be practised; and, since it removes large segments of work from the vision of research-workers, and denies them access to representative populations, it has serious disadvantages in relation to medical research.

These disadvantages can be overcome by accepting responsibility from the teaching centre for all services, institutional and domiciliary, preventive and curative, for a defined area. This would create a laboratory within which it would be possible to explore new patterns of practice, to demonstrate to students the best arrangements consistent with contemporary knowledge and resources, and to promote important subjects and methods of medical research which have hitherto been neglected. It can be done without prejudice to traditional interests by making the size of the defined area such that numbers of representative patients derived from it are reasonable in relation to numbers of selected patients drawn from a much wider area for other research purposes.

At present we are attempting to prepare students for the practice of medicine by methods more appropriate to its advance. In the new teaching centre they would learn both to acquire new knowledge, and to make the best use of such knowledge as we already possess.

'Penbritin' : An Oral Penicillin with Broad-spectrum Activity

STEWART, G. T., COLES, H. M. T., NIXON, H. H. AND HOLT, R. J. (*Brit. M. J.*, **2** : 200, 1961) from Queen Mary's Hospital for Children, Carshalton, Surrey, write :

'Penbritin' has a bactericidal action, comparable to that of penicillin G upon pyogenic cocci, upon a wide range of coccal and bacillary pathogens. It is affected by penicillinase and is therefore inactive against penicillinase-forming strains of *Staph. aureus* and certain coliforms.

Given orally in doses of 50-100 mg./kg./day, the new compound is freely absorbed and maintains a bactericidal level in the plasma for four hours or more. It is rapidly excreted, in very high concentration, in the urine.

Apart from transient rashes in three carriers of salmonellae, no toxic effects were observed in 28 patients who received the drug for five days or more.

Eight children with severe urinary infection due to coliforms and/or streptococci responded rapidly to treatment, as did six children with other infections; six carriers of *Salm. typhi-murium* and two of *E. coli* serotypes were not cleared of infection.

Penbritin warrants further trial as a bactericidal penicillin-like drug with the antibacterial range of the tetracyclines.

Safe and Effective Weight Control in Pregnancy

JORDAN, M. J. AND BADER, G. M. (*Surg. Gynec. & Obst.*, **112** : 663, 1961) from the Department of Obstetrics and Gynecology, St. Clare's Hospital, New York, give in the following lines the summary of their observations and use of diethylpropion as a safe and effective method of weight control in pregnancy :

A combination of the new appetite depressant diethylpropion, with supplemental vitamins and minerals was evaluated clinically in a group of 50 gravid women and confirmed previous reports of its value for safe and effective weight control in pregnancy. The recommended dosage schedule is 1 tablet 3 times daily 1 hour before meals, with a fourth tablet at mid-evening if required to control appetite. No special diet was prescribed in any case. When this drug was used for an average period of 8·6 weeks, there was an average weight loss of 0·24 pound per week.

There were no side reactions or allergic manifestations in any case. Diethylpropion does not produce central nervous system stimulation, insomnia, or any significant change in the blood pressure or pulse rate.

All deliveries were normal with healthy babies with the exception of one case which was complicated by an Rh factor.

The convenience of using an appetite depressant in combination with a vitamin-mineral supplement in a single tablet has obvious advantages.

Chronic Fibrocystic Disease of the Breast

OBERMAN, H. A. AND FRENCH, A. J. (*Surg. Gynec. & Obst.*, **112** : 647, 1961) from the Department of Pathology, The University of Michigan Medical Centre, Ann. Arbor, write :

Two hundred cases of benign breast disease, namely, fibrocystic disease, adenofibroma, and intraductal papilloma, have been reviewed clinically and histopathologically. The frequent occurrence of manifestations of fibrocystic disease of the breast, such as apocrine metaplasia or adenosis, within adenofibromas and intraductal papillomas has been noted. Likewise, the frequent concomitant occurrence of these conditions in the same breast has been cited. The frequency of recurrence of mammary disease in these patients has also been reviewed.

Adenofibromas, fibrocystic disease, and intraductal papillomas do not appear to represent distinct disease entities, but rather form a spectrum of conditions having their basis in an abnormality between hormonal stimulus to the breast, principally oestrogen, and stromal and epithelial response. Therefore, the authors suggest expanding the connotation of the designation fibrocystic disease to include this complex of lesions of the mammary gland.

Neurological Complications of Pelvic Fractures and Dislocations

PATTERSON, F. P. AND MORTON, K. S. (*Surg. Gynec. & Obst.*, **112** : 702, 1961) from the Trauma Research Unit, Department of Surgery, University of British Columbia and the Vancouver General Hospital, Vancouver, give in the following lines the summary of their observations on the neurological complications of fractures and dislocations of the pelvis :

Fifteen cases of fracture-dislocation of the pelvis with neurological complications have been reviewed and 1 similar case of interest has been reported. The sparse literature on this subject has been reviewed.

Neurological complications of fracture-dislocation of the pelvis are frequently undiagnosed, principally because of a lack of awareness of the possibility of nerve damage and because they are obscured by the associated severe bony and soft tissue injury.

The level and site of the nerve lesion would seem to vary. With fracture of the sacrum and with bladder disturbances the root level is indicated; with marked hemipelvic displacement one suspects lumbar or sacral plexus damage, particularly the lumbosacral trunk; in some cases direct pressure on nerve trunks seems to be the best explanation of the defect.

Nerve damage in pelvic injury is less common than genitourinary and visceral damage and about equal in incidence to vascular damage. Figures herein reported reveal that it is as great a clinical problem as sciatic nerve injury in dislocation of the hips.

The over-all functional results of this injury are good, 7 of 10 patients returning to heavy work with only slight compensable disability. Restoration of the neurological defect is, however, never complete.

A plea is made for a greater awareness of this injury and for more complete and careful neurologic assessment at the time of injury.

Perforated Peptic Ulcer

The findings of clinical-surgical conferences in Cook County Hospital (*Illinois M. J.*, **120** : 14, 1961) are summarised as follows :

Acute perforation of a peptic ulcer through all coats of the stomach or duodenum allowing free escape of gastric or duodenal content into the peritoneal cavity is the most serious complication of peptic ulcer.

Free perforations occur primarily in males, the ratio being 25 or 30 : 1, males to females. It is vastly more common between the ages of 25 and 60, though it has been reported in both extremes of age, including the newborn. No age group is truly free of peptic ulcer nor of this complication.

Free duodenal ulcer perforations occur four or five times more frequently than free perforation of a gastric ulcer. Most of these perforations are on the anterior wall, usually at the lesser curvature of the stomach (or superior border of the duodenum), where little walling-off by adjacent viscera can occur. About 25 per cent of all acutely perforated ulcers have no history of previous symptoms.

'Walled-off' perforations, or penetrating ulcers, occur with considerable frequency and probably comprise one-third of so-called 'intractable' ulcers, those quite resistant to medical treatment. They are usually on the posterior wall of the duodenum or along the lesser curvature on the posterior side of the stomach and are adherent to liver, pancreas, or gastrohepatic omentum.

The symptoms of free perforation of a peptic ulcer are usually heralded by sudden onset of upper abdominal pain which quickly becomes generalised. Nausea and vomiting usually follow the pain, and prostration is generally present.

Physical findings are classically those of a tender, rigid, silent abdomen, the patient resists change in position, preferring to lie flat and motionless. Tachycardia and normal or slightly elevated temperature are the rule; shock is rarely present until late in the course of the disease.

Approximately 80 to 85 per cent of perforated peptic ulcers will show varying amounts of free air on one of the usual 'four views' of the abdomen. The left lateral decubitus film is invaluable in demonstrating small amounts of air and should never be omitted when pneumoperitoneoum is being sought.

Surgical treatment of perforated peptic ulcer is the treatment of choice in almost all cases, especially those less than 24 hours old. The following procedures have been advocated :

(a) Simple omental graft;
(b) Closure of the ulcer;
(c) Excision of the ulcer and closure (with a pyloroplasty when necessary);
(d) Excision of the ulcer, pyloroplasty, and vagotomy;
(e) Gastric resection.

Each has its place, but at this time, simple omental grafting with a free or living graft is the choice of most surgeons for closing the perforation.

An extremely important aspect of the treatment of the acute perforation at the operating table is a thorough cleansing of the peritoneal cavity of gastric or duodenal content, food, etc., by meticulous aspiration of the peritoneal gutters, pelvis, and subphrenic spaces. Some authors feel this is the most important phase of the surgical treatment.

Preparative Radiation Therapy for Adenocarcinoma of Rectum

RUFF, C. C., DOCKERTY, M. B., FRICKE, R. E. AND WAUGH, J. M. (*Surg. Gynec. & Obst.*, **112** : 715, 1961) from the Sections of Surgery, Surgical Pathology, and Roentgenology, Mayo Clinic, and the Mayo Foundation, Rochester, Minnesota, from an analysis of 96 patients with adenocarcinoma of the rectum and rectosigmoid treated with preoperative radium observe :

Within the tumour, radionecrosis was preceded by swelling, hydropic charge, and vacuolisation of cell cytoplasm. Nuclei, early swollen and hyperchromatic, later became shrunken, pyknotic, and karyorrhectic. The necrotising effect was not uniform, since necrotic and actively growing tumour tissue could sometimes be seen side by side in the same microscopic section.

Early oedema and inflammatory infiltration of the tumour bed gave place later to fibrosis and hyalinisation. Sequential blood vessel changes included endothelial proliferation and oedema followed by fibrous thickening, thrombosis, and organisation.

Radium can, at times, completely destroy an adenocarcinoma of the rectum. In 10 of our cases, no residual carcinoma was found in the operative specimen. Radium sometimes makes an inoperable lesion operable. The authors observed 10 such instances, in 4 of which a 5 year survival was achieved.

The over-all 5 year survival rate was 43·7 per cent with the best results, 66·7 per cent, obtaining in patients who had Miles procedures.

The optimal time for surgical attack on the tumour after irradiation was not determined in this study.

Effect of Topical Nitrogen Mustard on Wound Healing

HARRIS, F. L. AND THOMAS, C. G. (*Surg. Gynec. & Obst.*, **112** : 684, 1961) from the Department of Surgery, School of Medicine, University of North Carolina, Chapel Hill, write :

A study of the topical effect of varying concentrations of nitrogen mustard, 2, 5, and 10 mg. per cent, on the tensile strength of healing in experimental wounds in mice indicates a loss of 41 and 52 per cent at 8 days with 5 and 10 mg. per cent respectively. There was no significant decrease with 2 mg. per cent nitrogen mustard. The topical use of nitrogen mustard was unassociated with any evidence of systemic effect. Histological examinations of wounds revealed no evident impairment of fibroplasia but an increasingly severe inflammatory reaction with higher concentrations of the mustard. The adverse effect of topical nitrogen mustard as observed in this experiment is probably on the basis of this nonspecific inflammatory reaction rather than any specific effect on fibropasia or wound healing *per se*.

CURRENT TOPIC

INDIAN MEDICAL ASSOCIATION

III STUDY TOUR, 1960

[Russia and Europe]

The following is the report of the I.M.A. Study Tour 1960, of Russia and Europe as submitted by Dr. H. N. Shivapuri and Dr. D. S. Mehra, Leader and Dy. Leader respectively of the Tour.

The party consisting of 61 doctors, members of the Indian Medical Association, including Drs. H. N. Shivapuri and D. S. Mehra—leader and deputy leader, left Palam Airport, New Delhi, on the 23rd August, 1960 at 12 NOON, by an Air-India Super-constellation.

U. S. S. R.

After a smooth and pleasant flight the party reached Tashkent at 5-15 P.M. (I.S.T.). Tea was served at the airport restaurant and after an hour the party emplaned again to resume the flight to Moscow. The plane had just taken off when it was discovered that one of the engines was not in order, and it was brought back to the airfield, off-loaded and the party was asked to wait in the transit hall. The customs examination of the baggage belonging to the members of the party was carried out now at Tashkent to avoid delay at Moscow. Dinner was served at the airport. The flight was finally resumed at 10-30 P.M. I.S.T. The rest of the journey to Moscow was smooth and uneventful.

August 24—The party arrived at Moscow at 6 A.M. (I.S.T.) or 3-30 A.M. Moscow time. The Moscow Airport is closed as a rule between 23 hours and 8 hours, and the plane was allowed to land at that unearthly hour only as a special case. The transport for a long drive to the city could be arranged only by 8 A.M., when the party was taken to the Hotel Ukraina, where accommodation was reserved. This is the biggest hotel in U.S.S.R. with 1,100 rooms in its 31 storeys. With an accommodation and arrangements for 2,200 guests the hotel maintains 4,000 members on its staff.

After breakfast the members of the party visited the Institute of Organisation of Health and History of Medicine in U.S.S.R. The Director of this Institute, Professor Alexander Shevelov, explained to the group the functions of the Institute which was named after Nikolai Semashko, the first Commissar of Health (1918) and the founder of the Institute. The main task of this Institute is to carry out organisation of health in different fields and population groups. It advises the Government on Economics of Health, i.e., how the development of health affects the economy of the country and what is the influence of economics on the health of the people. Professor Shevelov went to great lengths in explaining to the group the Soviet Medical System in which the State is entirely responsible for looking after the health of the people. He answered many questions from amongst the party which covered a wide field and elicited information on all aspects of Health and Medical Education.

That afternoon the members were taken on a general sight-seeing tour of Moscow, through its wide avenues and broad streets. The party went through the famous Red Square, Gorky Street and drove along the River Moskva on to the Kremlin. A visit inside the Kremlin was postponed to another day. The tombs of Lenin and Stalin could not be seen because the mausoleum was under repair and no visitors could be allowed. The weather on this day in Moscow had been inclement.

August 25—The party was divided into four groups according to the specialities :

1. General Surgery, 2. General Medicine, 3. Obstetrics and Gynaecology, and 4. Miscellaneous.

After breakfast the four batches were taken to different hospitals for special interests. The general impression was good. Moscow is divided into several districts and each district has a district hospital with several polyclinics (out-patients clinics) attached to it. Patients are admitted to the hospitals through them. The standard of operations and equipment is very high; for example, in one such hospital visited there were for 460 beds, 260 nurses and 123 doctors. The equipment and other personnel were in a similar proportion.

In the afternoon, the House of Friendship gave the visitors a reception. Some important members of the medical and other professions were present. One of these was the Russian lawyer who was deputed by the Russian Government to defend the U-2 pilot, Francis Powers. After a few speeches of welcome and reply and some light refreshments, the group was entertained to a Russian movie, "Dances in the Spring", at the auditorium.

After this reception the members of the party returned to the Hotel by the Metro, which is the underground railway. The Metro in Moscow as well as in Leningrad are the best amongst the underground railways the party saw in most European countries.

August 26—The Ambassador for India in U.S.S.R., Mr. K. P. S. Menon, invited a few from the party for breakfast, which the leader with three attended.

Later the party again split up into groups for visits to the hospitals. One group visited the Skliposovsky Institute where some interesting demonstrations were arranged. A suturing instrument used for quick suturing of blood vessels and such viscera as lungs, bronchus and stomach was shown. The suturing material is a thin wire of tantalum. The instrument is ingenious, but the surgeons amongst the group were sceptical and thought that because of its bulkiness its applicability was limited particularly when used for ligating the arteries. The arteries being of varying thickness may not be easily tackled with this instrument. Its use, however, in lung surgery was definitely appreciated. A demonstration of the instrument was given to another group that visited a tuberculosis hospital in the outskirts of Moscow on the same day. After a wedge resection of the lung for pulmonary tuberculosis, the lung was sutured with tantalum with the help of this instrument. The metallic sutures are in all cases seen on an x-ray subsequently. The Skliposovsky Institute gave another interesting demonstration; withdrawal of blood

from a cadaver for transfusion purposes. About 4,000 ml. of blood is collected from cadaver within six hours of a sudden death. No citrate or heparin is added to this blood. It was explained that blood of persons who died suddenly exhibit a phenomenon called "fibrinolysis", by which the blood does not coagulate. Transfusion reactions are very few because no anti-coagulants are used. To this blood, however, an antibiotic in glucose solution is added. Parts of skin, cornea, bones and some other parts are also preserved for a "spare part" service for other patients.

The Director of the Institute, Professor Petrov, and other members of the staff were very courteous and helpful to the visitors.

The doctors who were taken round to the Tuberculosis Hospital had an enjoyable time. The hospital was situated in beautiful surroundings, some 25 miles out of Moscow. This hospital is really a base hospital which prepares patients for a longer stay in sanatoria. The hospital is well equipped for all types of tuberculosis surgery. They were experimenting with some newer anti-tuberculous drugs but so far with indifferent results. Artificial pneumothorax and pneumoperitoneum were completely discarded in this institution.

After lunch the party visited a Permanent Exhibition of Russian Industry, Art and Agriculture. In a vast enclosure the 15 autonomous republics that constitute the U.S.S.R. displayed their own farm products, and arts and crafts. There was a special enclosure for atomic energy and nuclear physics where models of sputniks and actual rockets used in outer-space explorations, were being exhibited. The Medical section exhibited some surgical instruments and medical apparatus manufactured in Russia. An interesting film of surgical operation by which the head of a dog was transplanted to the body of another dog, was also exhibited.

Leningrad

August 27—After dinner on August 26, 1960, the group left for Leningrad by the Red Arrow Express, a fast train which reached Leningrad by 8-50 A.M. The members were lodged in Hotel Moskva opposite the Leningrad station. After breakfast they were taken on a sight-seeing tour of this historical city. Leningrad is more beautiful than Moscow; situated on both the banks of River Neva and Gulf of Finland. Leningrad appears to be a more lively city. After lunch the party visited the famous Hermitage Museum and the Winter Palace of the Czars. The Hermitage is a museum where are kept nearly 2,00,000 pieces of Art collected from various countries. There is a good representation of Dutch and French paintings in particular, but the Indian section is poor.

Afterwards we visited a Department Store where things were sold at controlled prices.

August 28—After breakfast the party visited Peterhof, the Summer Palace of Peter the Great. This place has beautifully kept grounds and 130 fountains of various sizes and shapes. Some of the fountains had ingenious contraptions that depicted what a practical joker Peter the Great was.

After dinner the party left for the station to take the train back to Moscow.

August 29—By some lapse on part of the Travel Agents the members got accommodation in a slow train and not the Red Arrow by which they came to Leningrad. They reached Moscow at 9-45 A.M. and after a hurried breakfast at the Hotel Ukraina were taken to the Kremlin to see the Archangel Cathedral and the palaces of the Czars in use before the capital was transferred to St. Petersburgh (now Leningrad). After lunch, the Moscow Radio, which has a recording unit at the Hotel Ukraina, recorded the impressions of the tourists about their visit to U.S.S.R. Messages were recorded in four languages; Dr. Shivapuri speaking in English, Dr. Mehra in Hindi, Dr. Sen in Bengali and Dr. Mrs. Radha Mahdevan in Tamil, for being broadcast on the Moscow Radio on its special service for India.

In the afternoon the House of Friendship again played host to us; the members were shown two interesting scientific films, one on an heart operation and the other on investigations on two sets of Siamese twins. Throughout their stay in Moscow and Leningrad they were provided with English speaking guides who were extremely courteous and helpful.

August 30—It was originally scheduled to leave Moscow by an Ilyushin for Stockholm. But one or two days earlier the Ilyushins were all grounded so the party was given a Finnair Caravelle, a jet which brought them to Stockholm in 2 hours—7-30 A.M. Stockholm time.

Sweden

On arrival at Stockholm the party was taken to the Palace Hotel which was a nice little hotel. Due to our arrival in Stockholm before the schedule time some members of the party did not get rooms till about 2 P.M. and they had to wait in the lobby for hours. This was very annoying and naturally resented.

After breakfast Dr. Shivapuri and Dr. Mehra paid a visit to the Indian Embassy where they met the first secretary Mr. Dhawan. The Ambassador was away on a short visit to Denmark. This day in Stockholm a heavy downpour marred much of the fun of sight-seeing. Through torrential rain the party was taken round the city to see its Town Hall, a building of great historical importance, and other important landmarks. The beautiful city of Stockholm is situated on 11 islands.

August 31—This morning the party visited the Serafimerl Asarette, a very old hospital run by the City. It is now proposed to pull the hospital down to make room for offices for the city. The following three lectures were arranged for the party at this hospital :

1. The Organisation of Medical Care in Sweden by Dr. O. von Zweigbergk.
2. Swedish Medicine of Today, Teaching, Research and Hospitals by Professor Gunnar Biorck.
3. Some Aspects of Swedish Social Policy by Dr. B. O. Nilsson.

These three lectures were very informative. In the afternoon the members visited KIFA, a concern for the manufacture of surgical instruments and diagnostic x-ray machines, where they were entertained by light refreshments. Next the party visited Sales Organisation and Showrooms of the Swedish Medical Association, where the working of some new apparatus and devices and inventions of the members of the Swedish Medical Association were demonstrated. There were an apparatus for blood sedimentation rate determination, an orthopaedic appliance and an apparatus for testing the hearing. This was an interesting programme.

This was followed by a Reception by the Swedish Medical Association in their building. The members of the party met some prominent members of the profession also their President, Dr. Dag Knutson. Dr. Knutson gave a talk on "Relations of the Medical Profession to the Government and the Society." In a most informal way Dr. Knutson kept the members absorbed in his very interesting discourse.

September 1, 1960—The morning was devoted to a visit to the Southern Hospital. This is a modern hospital with 1,600 beds and uptodate equipment. The hospital was built at a cost of an equivalent of Rs. 50 million and a like amount is required annually for recurring expenses. There are seventeen polyclinics (OPD) attached to the hospital.

In the afternoon the party visited the Karolinska Hospital where on arrival they were received by Dr. Hans Ericsson. The party was then split into three groups and each group had excursions through the three most important departments of the hospital, viz., 1. The Radiumhemmet (Radio-therapeutic Clinic), 2. The Paediatric Clinic, and 3. The New Central Laboratory Building.

In a general way one can say that Sweden's most important problems are its aged and the diseases that go with the age, and mental diseases. The country has 44,000 mental beds as compared to 60,000 beds for somatic diseases. Paediatric diseases are mainly confined to congenital defects. They have an excellent paediatric surgical service mostly for developmental anamolies of the heart and other parts.

The Karolinska is a University Hospital and is the anthority that determines every year, who should get the Nobel Prize for Medicine. Its Radiumhemmet is equipped with isotopes and cobalt guns. The hospital has 1,876 beds with an annual expense of Rs. 45 million. The visit to this hospital had been most satisfying.

September 2—Dr. Shivapuri and Dr. Mehra visited the Industrial Exhibition where many European countries were represented. It was quite a good show.

The party left in two groups from Bromma Airport for Copenhagen. Both the batches travelled by S.A.S. aircraft. At Copenhagen the party remained in transit at the airport for another S.A.S. connection to London. While waiting at the airport members made a good use of the duty-free shops at the airport. When the group got into the plane it was noticed that the seats were oversold. Some other nationals were off-loaded from the plane and an appeal was made to us for two volunteers to similarly get down and take the next flight to London. Drs. Mehra and Tandon offered to get off. The S.A.S. took care of them and even had temporary visas made for them to spend the night in the city. They were flown to London next morning by another S.A.S. flight, arriving in London about midday.

LONDON

September 3—The morning was spent leisurely and after lunch the group left for a sight-seeing trip of the City of London proceeding by way of Marble Arch and Hyde Park to visit the Westminster Abbey. Then passing through important landmarks in London the party went to the Tower of London. From there the members went to St .Pauls Cathedral and then along Fleet Street to Dicken's Old Curiosity Shop. This gave them a good general view of the City of London.

September 4—Being Sunday, morning was at leisure in London. In the afternoon the members of the party took a trip to the Windsor Castle and on the way saw Eton College. At the Windsor they visited the Church and the State Apartments, and on their way back the Hampton Court with beautiful garden planned very much like the Verseilles Gardens in Paris. Before coming to the Hampton Court coaches passed the spot where King John signed the Magna Carta in 1215 A.D., Runnymede, situated along the Thames and now a popular picnic spot.

September 5—This morning 25 members of the party visited Folkstone on the invitation of Messrs. Pfizer Ltd., to visit their manufacturing plant at Sandwich. The party led by Dr. Mehra, left for Folkstone after breakfast by a train from Charing Cross Railway Station. The train leaving Charing Cross at 9-10 A.M. arrived at the Folkstone Central Station at 10-58 A.M., were they were met by Mr. F. L. Jenkins, the Public Relations Officer of Messrs. Pfizer. He travelled with the party from Folkstone to Sandwich in a coach. This was a very pleasant drive and the members had an excellent view of lovely English countryside. Driving along the South-East coast of England the members could see at one spot the French coast across the English Channel, the day being bright and sunny. The party arrived at the Guilford Hotel, Sandwich at about 12 NOON. Here Dr. Heath, the Senior Virologist on the Pfizer staff, gave a very informative lecture on "Prophylaxis in Poliomyelitis". He dwelt on some important epidemiological factors with regard to poliomyelitis and gave the visitors an insight into the polio vaccine production. Pfizer are manufacturing both the live and killed polio vaccine, and Dr. Heath explained the relative merits and demerits of the two types of vaccine. Dr. Heath's talk was followed by a discussion in which the visiting doctors took part. After the lunch at Hotel Guilford they went round the factory; a visit to their vaccine production unit was of special interest. At 3-30 the party left by coach for Folkstone to catch the 4-43 P.M. train back to Charing Cross. Tea was served in the train by the courtesy of Messrs. Pfizer.

The rest of the party led by Dr. Shivapuri paid a visit to the Glaxo Laboratories at Greenford in Middle-

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PARKE-DAVIS

MOUNTING CLINICAL EVIDENCE ON

CAPYNA COMPOUND

Dr. P. J. Haridas, M.B.,B.S., T.D.D., Superintendent, T.B. Sanatorium, Buldana, tried CAPYNA COMPOUND along with standard anti-tubercular therapy on 10 hospitalised cases which had been treated on an average for about two years with Streptomycin, I.N.H. and P.A.S. and which were not improving on that therapy.

Results: General condition improved in 100%, Temperature decrease 100%, E.S.R. decrease 100%, Weight increase 80%, Sputum conversion 43%, Radiological clearing 80%.

No toxic side-effects of any sort were noted during therapy.

The author concludes that CAPYNA COMPOUND has a definite place in the treatment of pulmonary tuberculosis, more so, in advanced cases which have become refractory to conventional anti-tubercular antibiotic and chemotherapy.

J.I.M.P., 1961,3,3684.

Dr. S. K. Das, M.B. (Cal.), T.D.D., F.C.C.P.(U.S.A.), Department of Tuberculosis & Chest Diseases, Calcutta Medical College, tried CAPYNA COMPOUND either alone or concurrently with the standard therapy in 34 cases of tuberculosis which had failed to respond to the standard therapy or which after some initial improvement had become partially resistant to that therapy or which could not tolerate any or all of the standard therapeutic agents.

16 cases of pulmonary tuberculosis which had failed to respond to standard therapy or which had become static after initial improvement on the therapy showed progressive improvement, when CAPYNA COMPOUND was added to therapy. The anti-pyretic effect was particularly gratifying.

Current Medical Practice, 1961, 3, 155.

Dr. V. B. Damle, M.D., D.P.H., "CAPYNA COMPOUND therapy was conspicuous by the total absence of untoward side-effects and the patient who got moderately severe to severe gastric upsets with I.N.H. and P.A.S., volunteered the information that not only was there no discomfort, but on the contrary there was a feeling of soothing comfort after the CAPYNA COMPOUND tablets. There was no diarrhoea and no vomiting."

J. I. M. P., 1960, 12, 3051.

Dr. M. R. Mistry, M.S., F.R.C.S., F.C.P.S., "I have used CAPYNA COMPOUND tablets for indoor and outdoor patients at St. George's Hospital, Bombay for tuberculosis of glandular origin with very good results. T. B. glands of neck or any where else respond well to CAPYNA COMPOUND."

The Indian Practitioner, 1960, 9, 835.

HD-15

Descriptive literature available on request

THE HIMALAYA DRUG CO., 251, Dr. D. Naoroji Road, Bombay I (India)

sex by a coach arranged by the Glaxo Loboratories. They were taken round the manufacturing and research departments. After tea the party returned to London.

These two trips were much enjoyed by the members and provided a change and much needed diversion from routine sight-seeing.

September 6—The morning was spent in a visit to the Wellcome Building where the members had an opportunity of drowsing through the Wellcome Museum and the Wellcome Medical Library. Unfortunately for want of time, the party could not do justice to the kind invitation of Messrs. Burroughs Wellcome to visit their museum.

In the afternoon the British Medical Association played host to the members at a Reception in the BMA House at Tavistock Square. Dr. R. A. Pallister of the Commonwealth Advisory Bureau received the members and showed them round the building. Dr. Pallister and two other members of B.M.A. spoke on National Health Service in the United Kingdom. Some members of the visiting group participated in the discussion that followed the talks. Dr. A. P. Mittra, the Honorary General Secretary of the Indian Medical Association, and Mrs. Mittra were also present during the visit to the BMA House. After the talks they were entertained to tea by the BMA.

September 7—In the morning some members visited three of London's leading Hospitals, namely Middlesex, Guy's and St. Bartholomews. Dr. Mehra and six others visited Dagenham at the invitation of Messrs. May & Baker. Mr. B. R. J. Walker, their Public Relations Officer, conducted them from the hotel in London to Dagenham. On arrival coffee was served after which an interesting film on heart operation was exhibited. The surgeon was Mr. Holmes Sellor, the famous London Chest Surgeon. The operation was done under hypothermia for atrial septal defect, at the Middlesex Hospital. The film, which ran for 35 minutes was highly instructive. This was followed by a tour of their works and laboratory. The same was resumed after a break for lunch. After tea at 4-30 P.M. the party returned to London. Messrs. May & Baker then played host to the members at a dinner at Manetta's Restaurant at Mayfair. Some members of the May & Baker staff and their wives were present. Dr. and Mrs. Mittra also joined this dinner.

PARIS

September 8—The party left London early after breakfast by an Air France plane, but by the time port formalities were gone through at Paris the whole morning was spent. The members reached their respective hotels at about 2 P.M. After lunch the members visited places like Eiffel Tower, the River Seine, etc.

September 9—This morning the members were taken round the city of Paris and shown such important places as Champs Elysees, Notre Dame etc.

In the afternoon about 30 members visited the Roussel factory and watched the production of antibiotics and corticosteroids. Messrs. Roussel entertained them to light refreshments and champagne.

GERMANY

September 10—An Air France plane brought the party from Paris to Airport Frankfurt at about 10-50 A.M. After the usual port formalities the party left by two coaches for Gut Neuhof. This is a farm that has existed since the year 1499. In the farm there is a nice inn surrounded by a garden with beautiful flowers. The members were served lunch at this inn. Dr. Shivapuri was met by a friend Mrs. Helen Leinweber, her son and a friend Miss M. Schule. They invited him to their house at Hainstadtam Main. After lunch at Gut Neuhof the trip was continued through lovely Odenwald mountain to Bensheim-Auerbach, where the members were accommodated at the Hotel Krone. Tea was served on arrival. Dr. Shivapuri left to spend the night with his friends, the Leinwebers. After dinner some members of the party visited the Beer Festival, at a short distance from the hotel. This is a sort of a prelude to the German national festival, the October Festival. There is much dancing and rejoicing on this occasion.

September 11—This morning was earmarked for a visit to Heidelberg. This was a lovely drive by a motor-coach on the Autobahn, the National Highway, over which a speed of less than 50 kilometers is not permitted. Heidelberg is an old historical town on River Neckar, where the members visited the Castle and the University. Thereafter the trip was continued along the Neckar valley on to Castle Hirschhorn where they had lunch. After lunch they returned *via* Bad Wimpfen. Dinner was taken at Hotel Ritter at Heidelberg. The party returned to Hotel Krone at Bensheim for stay overnight.

September 12—In the morning the members returned to Heidelberg for a visit to Czerny Hospital of Heidelberg University. This hospital is an Electrical and Radiological section of the Medical Faculty. Here the members had the opportunity of seeing the newest radiological machines, therapeutic and diagnostic, and isotpes. For lunch they were the guests of Messrs. E. Marck, the Pharmaceutical concern at Darmstadt. After the lunch at Ratskeller, Darmstadt, the party drove to their factory for a visit. After this they drove to Frankfurt for dinner and overnight at the Hotel Monopol-Metropole.

September 13—After breakfast the party set out on a sight-seeing excursion of Frankfurt, beginning with a visit to Goethe-house, the house of Germany's national poet. This was followed by a visit to King's Hall where all the Kings used to be crowned, and where there is a gallery of the Kings' pictures. That building is now the Town Hall (Rathaus).

Lunch was taken at Kaisekeller, an open-air restaurant. The afternoon was free and the members went on a shopping spree.

September 14—After breakfast the party left by motor-coach for a visit to Farbwerke Hoechst, where the members were taken on an excursion through their pharmaceutical plant and the pharmacological laboratories. Later they were the hosts of the tourists at a luncheon at Palmgarten in Frankfurt. After this the

party returned to Hotel Monopol-Metropole prior to departure for Berlin in two groups. One group led by Dr. Shivapuri left at 20-15 hours by a Lufthansa plane for West Berlin. The other group led by Dr. Mehra, after dinner at Kaiserkeller, left for Berlin at 23-50 hours by a PAA plane. In Berlin the party was lodged at Hotel Am Zoo on Kurfuerstandamm, the main street in West Berlin.

September 15—The party left for a general sightseeing of West Berlin and a visit to the Standtische Frauenklinik (Female Clinic) in Charlottenburg District of Berlin. This hospital was very impressive. It has 150 beds for obstetrics and gynaecology and 50 beds for children. The members of the staff were very helpful. Light refreshments were also served. The next place to be visited was the Westend Hospital (Westendkrankenhaus). Here the party split up into batches according to special interests and various departments were visited. Both this hospital and the Female Clinic are attached to the Berlin University and are very well equipped.

Lunch was taken at a restaurant near the Radio Tower. The restaurant is the biggest in Europe, accommodating nearly 3000 diners at one time. After lunch excursion through West Berlin was resumed. The party entered East Berlin from the British zone of West Berlin, past the Brandenburg Gate. Here after a brief but courteous border checking they were allowed to visit East Berlin. East Berlin presents a picture of ruins and desolation; 70 per cent of East Berlin's war-destroyed buildings are still in ruins. The Russians have built an impressive War Memorial in East Berlin, whereas such buildings as Hitler's Chancellery, the Reichstag and other buildings of War fame are in ruins. The members returned to West Berlin through the American sector.

September 16—This was the day of the Inaugural session of the General Assembly of the World Medical Association. The 61 doctors of I.M.A. from India were privileged to attend as observers. They went in the morning to the Congress Hall, where the Assembly is meeting, for registration. The Assembly was inaugurated at 15-00 hours by the President of the Federal Republic of Germany, Dr. Heinrich Lubke. The 63rd Conference of the German Medical Association was also holding its session along with the 14th General Assembly of the W.M.A.

In the evening Herr Wilt Brandt, the Governing Mayor of West Berlin, gave a reception to all the delegates and observers at the Town Hall (Rathaus), when nearly 2000 guests were entertained.

September 17—The General Assembly of the W.M.A. began its deliberations this morning at the Congress Hall, while special trips were arranged for visits to Berlin Hospitals for the interested delegates. Dr. Shivapuri and Dr. Mehra paid a visit to the Havelhohe Lungem Klinik some 25 kilometers from the Congress Hall. It is a Chest Hospital situated in beautiful surroundings on the bank of River Havel. The hospital is very well equipped with the latest instruments for chest surgery, cardiopulmonary function tests, radiology and pathology. They watched an operation of lung lobectomy for a round shadow on the x-ray, and while the patient was still on the table the pathologist had submitted a report on the resected specimen that it was a tuberculoma. We also watched a bronchoscopy being done under general anaesthesia with the newest instruments and an arrangement for taking spot photographs through the bronchoscope.

In the afternoon an exhibition of medical films was arranged in the Congress Hall.

September 18—The morning session of the Assembly was devoted to a discussion of the "Child in a Technical Civilisation". This was an extremely interesting discussion on a topical subject.

In the afternoon an exhibition of some very interesting films was arranged. These films were presented by different countries and demonstrated such subjects as catheterisation of the heart, cardiac surgery and resuscitation of the heart.

In the evening some pharmaceutical firms played host to all the delegates, observers, etc. at a reception and cold buffet at Hotel Berlin Hilton.

September 19—This morning the British Medical Association presented a nice selection of medical films on some important medical problems including bronchogenic carcinoma and tuberculosis in children. On the business side the Assembly considered the Socio-Medical Affairs' evaluation of the increased cost of medical care under Social Security Systems.

The stay in Berlin had been most fruitful and the Session of the W.M.A. General Assembly gave the members of the party an opportunity of witnessing some very interesting and instructive medical films, as also the opportunity of meeting doctors from all parts of the World.

September 20—After breakfast the members of the party left Berlin for Munich. In Munich they were accommodated in two hotels; Hotel Daniel and Hotel Stachus both situated in Stachus which is said to be the busiest square in the whole of Germany. After lunch they went out to see the important sights of this old-time capital of the Bavarian Kings. They saw the Marstallmuseum, where there is a unique collection of vehicles and carriages of the Bavarian Kings. In the evening at dinner at the Hotel they had the pleasure of the company of some leading doctors of Munich including Dr. Sluka, the Secretary of the Medical Association and an Indian doctor, Dr. Bannerji.

September 21—At about 1 A.M. Dr. Rangacharyulu got sick with acute pain in the perineal region because of haemorrhoids and fissure. Dr. Mehra took him to the University Surgical Clinic, where he was admitted for observation. In the morning on the way to a visit to the "Rechts der Isar", a new hospital, some members went and saw Dr. Rangacharyulu. The "Rechts der Isar" is a 1300 bed hospital with a well organised surgical unit, and a very efficient Emergency department.

Dr. Sat Tandon also got fever in the morning but was better in the evening.

Dr. Rangacharyulu returned from the hospital in the evening.

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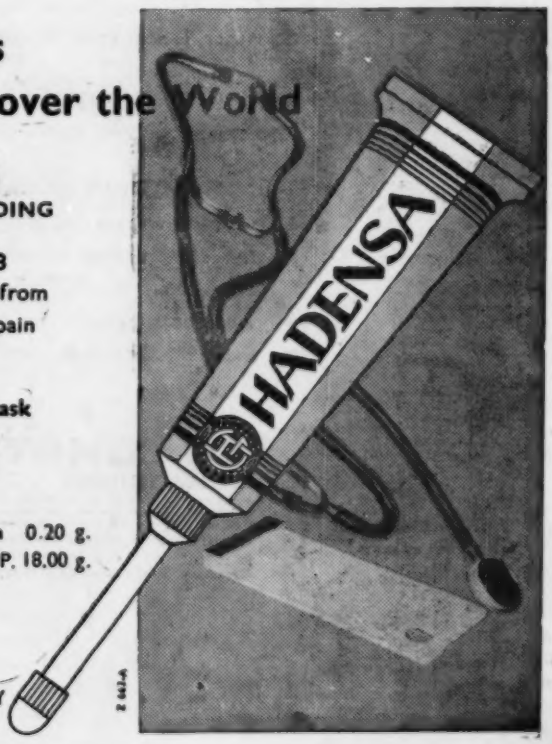

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AUSTRIA

September 22—One batch led by Dr. Shivapuri left for Vienna in the morning. Some amongst those who were to leave in the afternoon for Vienna did some sight-seeing on their own, and such places as the Deutsches Museum and the Cathedral in Marienplatz were visited. This group then left Munich at 17-00 hours, for Vienna by Al Italia. The party was lodged at the Hotel Westminster and dinner was served at Bauernfeld restaurant.

September 23—This morning the members visited the Allgemeines Krankenhaus, the World famous University of Vienna Hospital. The party was divided into groups according to the special interests after a cordial welcome by Professor Schonbauer, the Director of the Institute. The visit through the various departments of the hospital was a wonderful experience by all concerned and all were impressed by the high standard of the Hospital. After lunch the members had another nice experience when visiting the Baumengarten in the outskirts of Vienna. This is a rehabilitation centre for the accident patients run by the welknown orthopaedic surgeon, Professor Bohler. It was indeed a treat to see this centre and Prof. Bohler, who at the age of 75 was making plans for the next ten years.

September 24—Another visit was paid to the Allgemeines Hospital and again the members visited the various departments in groups.

After lunch they went out on a sight-seeing tour of Historical Vienna including a visit to the Belvedere Palace and the Summer Palace of the Austrian Emperors.

September 25—This being Sunday there was no programme. Members went out on their own to visit such places as the Spanish Horse Show and Church Bazars.

September 26—This morning the members visited the newest of Vienna's Hospital, the Unfallkrankenhaus—the Accident Hospital. This hospital admits industrial and traffic accident cases only and is run by Insurance companies that insure workers against sickness and accidents. With a bed strength of 212, there are 25 doctors on the staff. Its annual admission is about 40,000 cases and the daily attendance in the OPD is 350 to 400 cases. It has the most elaborate surgical, radiological and rehabilitation services.

Messrs Sanabo, a Vienna Pharmaceutical firm, invited the party to visit their factory in the afternoon.

After dinner the members visited the Osterreichische Arztekammer, the Austrian Medical Association where a reception was held in their honour. The members met some prominent Vienna doctors including the President and the Secretary of the Austrian Medical Association.

September 27—This morning the members saw a unique institution, the Home of the Aged or Altersheim Baumgarten. An institution run by the City of Vienna for women above 60 and men above 65, who sought admission there. The City spends about Rs. 18-00, 75 Austrian Schillings daily per person. With 1200 beds and 10 doctors the Institution looks after the aged of Vienna.

In the afternoon the members called on the Mayor of Vienna at the Town Hall (Rathaus) and were shown round the historical building that is Town Hall.

In the evening Dr. Shivapuri paid a visit to the Gevshoof Fraunklinik of Vienna. Mrs. Lutty Kuzera, a friend of Dr. Shivapuri, conducted him to this Gynaecological and Obstetrics Hospital. This hospital has 150 beds and is complete with x-ray and laboratory facilities. Every year about 4,000 labour cases are conducted and an equal number of gynaecological operations done.

SWITZERLAND

September 28—This day ended our visit to Vienna. One batch led by Dr. Shivapuri left for airport after breakfast to take an Austrian Airways plane to Zurich. There was some trouble at the Airport when the members were charged 80 schillings each for excess baggage. The trouble came up only because of the tactless handling of the situation by the conductor Mr. Multani. A very excited and discontented group arrived in Zurich. The other batch which left Vienna at 18-05 hours by a Swiss Air plane had no difficulty, thanks to the conductor Mr. Baveja. When the second group arrived at Zurich and reached Hotel Stoller they found the members of the first group in a rebellious mood. Immediately the leaders and Mr. Baveja went into conference. Mr. Baveja tactfully handled the situation by agreeing to refund the charges paid at Vienna. He, however, had to contact his office at Bombay over the telephone to obtain the permission for refund.

September 29—The party left for Basel after breakfast, arriving their in motor-coaches *via* Baden, Brugg and Rheinfelden. In Basel the members drove straight to CIBA Company to visit their pharmaceutical factory. After an excursion through their various departments they were their guests at a luncheon at the Restaurant Zoologischer Garten.

After lunch a visit was paid to the Sandoz factory across the River Rhine. They were entertained to tea by the Sandoz Company.

In the afternoon the party came to Hotel International at Basel for an overnight stay.

The dinner was given by Sandoz at "Zunfthaus zum Schlussel" or the Keymaster's (blacksmith) Guildhall. This is a 15th century building, where the members were entertained not only with excellent wine and food but also the music of a band peculiar to Basel. The dinner was followed by a film about an expedition of Swiss mountaineers, to the Himalayan peak Annapoorna. A member of the Sandoz staff was one of the participants of this expedition. The members turned late at night to Hotel International.

September 30—This morning was earmarked for visits to the other two pharmaceutical firms in Basel; the Hofmann-la-Roche and Geigy. Two groups were made one visiting Roche and the other Geigy. After the visits to their respective factories, the two firms were hosts of the party—at a luncheon at the Restaurant Casino.

After lunch the members proceeded on a sight-seeing excursion in a heavy downpour. Much of the fun of sight-seeing was lost in the rain.

The party returned to Zurich by 18·00 hours.

October 1, 1960—In the morning after breakfast, 80 schillings each were refunded to all those who had to pay excess baggage charges at Vienna. Then the members proceeded to Lucern and Mount Pilatus in motor-coaches. After visiting some important landmarks in Lucern the members went upto Mount Pilatus by the Funnicular Railway. They spent a most enjoyable time there amidst snow and had a nice lunch at the Restaurant "Pilatus Kulm". They returned by means of cable cabin to Krienz. The motor-coaches were waiting for the party at Krienz. From here the party returned to Zurich by skirting the Lake Lucerne and passing through some extremely lovely resorts along the lake.

October 2—This morning the members of the party visited the "Zurcher-Heilstatte" a tuberculosis hospital at Wald, amidst picturesque surroundings. Dr. E. Haefliger, the Chief Doctor, received the members and gave a short talk on preventive and curative aspects of tuberculosis and showed some interesting x-ray films. There was an interesting discussion after the talk, in which the members participated. After this they were taken round the hospital. Dr. Haefliger and his staff were very courteous and helpful to the members. After this the party drove down to Rapperswil for lunch at Restaurant "Seestern" situated on Lake Zurich, and were joined at lunch by the President and the Secretary of Zurich Medical Association. The Secretary is a non-medical man, a lawyer. The President gave some interesting facts and figures about the medical profession and the Medical Association in Switzerland.

After lunch the party returned to Zurich *via* some more lovely spots.

Italy

October 3—A batch of 22, led by Dr. Shivapuri left after an early breakfast by a Swiss Air Plane for Rome *via* Milan. The second batch led by Dr. Mehra left Zurich at 15·00 hours by an AlItalia plane. In Rome the members were accommodated at Hotel Tiziano.

October 4—The members left very early in the morning for Naples as guests of Messrs. Lepetit Pharmaceuticals. They stopped on the way at a place called Fornia and had breakfast at a restaurant on the Mediterranean. The journey was then continued onward to Naples, where they visited the Lepetit Factory at Tone Annunjiata. They were then taken to the City of Pompei where lunch was taken at Hotel Swisse. After lunch the party visited the historical ruins of Pompei and had a distant glimpse of the volcano Vesuvius, which ruined Pompei in the pre-christian era.

After lunch they drove to a place called Sorrento which is situated in a picturesque Mediterranean peninsula opposite the famous island of Capri. This was a most enjoyable drive and at Sorrento, members did some shopping at beautiful little shops. From Sorrento one could get a wonderful view of the Bay of Naples and the calm and quiet Mediterranean. The party returned to Naples for dinner at Restaurant Transatlantic, situated right on the harbour. With a full moon the harbour looked really grand that night and one could also have a beautiful view of the lights of the town of Naples. Messrs. Lepetit were again the hosts of the party at dinner. The members returned to Rome at about 2 A.M. under a heavy downpour. This excursion was thoroughly enjoyed by everybody even though it was long and tiring.

October 5—After breakfast the party went to the Vatican City and saw the Vatican Museum and St. Peter's Church. It was indeed a treat to see Michel Angelo's paintings at both the places. After this the members saw some other places such as the Coin Fountain, Garibaldi's statue and a bird's eye view of Rome from on top of a hill where some important landmarks were pointed out.

The party returned to hotel for lunch and thereafter went out for shopping or sight-seeing.

After dinner the members were transferred to the Airport at 10 P.M. for flight back to India. The Air-India Boeing 707 arrived an hour late from London and Frankfurt and the party of doctors left Rome at 2-10 A.M. on October 6.

October 6—They arrived in Cairo at 6 A.M. Cairo time (5 A.M. Central European Time). After a stop and light refreshments, they left Cairo at 7-15 A.M. (Cairo Time) and arrived at Bombay at 3-45 I.S.T. (12-15 C.E.T.). At Santa Cruz Air Port the Bombay Territorial Branch of I.M.A. gave the members a reception. The same night they gave a dinner to the Leader and the Deputy Leader at the Willingdon Sports Club.

Most members of the group left for their respective homes the same evening.

October 7—Dr. Shivapuri and Dr. Mehra and three others left for Delhi at 7-15 A.M. by an Indian Airlines Viscount, where they reached at 10-15 A.M.

Thus ended the I.M.A. 3rd Study Tour to Europe and Russia. Barring a few unpleasant incidents, the tour had been very enjoyable, profitable; a time well spent.

NOTES AND NEWS

Life of Bacteria in Outer Space

Dr. Charles G. Walance, a U.S. scientist, said recently that there was no chance of the seeds of life drifting through space from star to star.

Thirty days' exposure to the vacuum of space kills bacteria by causing them to disintegrate molecule by molecule, he said. This finding by Dr. Walance shows that certain metals previously considered for space ships evaporate in space vacuums.

Long and expensive sterilisation of space vehicles to prevent contamination of other planets with earth germs probably can be eliminated from current planning. Earth bacteria, Dr. Walance said, could not survive any space journey longer than 30 days.

A recent study showed that three types of bacteria survived five days' exposure in a man-made vacuum similar to that found 200 miles out in space.

The tests showed that bacteria lived as long as 10 days under similar conditions. "But when we duplicated the vacuum existing further out in space and maintained them for 30 days, all life died", Dr. Walance said.

High Radioactivity found in Rain Water

High radioactivity was detected on the night of September 8, 1961 in rain water at Tokyo for the first time since the new series of Soviet nuclear tests.

The detection, made by a radiology laboratory on the Pacific coast showed 1,800 counts of radioactivity per litre—a radioactivity of 3,850 micro-micro-curies.

According to a Reuter message from Washington the fall-out from Russia's second nuclear test of the present series, four days after the test, was still hovering over North-East Asia, according to the U.S. Weather Bureau.

The cloud of radioactive debris caused by the test, has apparently been caught in a slow-moving high-pressure cell circulating over the area, a bureau spokesman said.

Food Treated with Mild Dose of Radiation

Foods treated with a mild dose of radiation can be kept fresh for days without refrigeration, says a U.S. Atomic Energy Commission (A.E.C.) scientist. Radiation exhibited the growth of bacteria and the foods could be eaten without ill effects, Dr. Paul Aebersold, Director of the office of isotopes development in the A.E.C., said recently in a paper prepared for the tenth Pacific Science Congress.

The process, called radiation pasteurisation, makes it unnecessary to freeze perishable foods. Mild doses do not cause any change in flavour or odour.

One Doctor for Every 2300 in U.K.

India and the other Commonwealth countries were "keeping the hospital services going" in Britain, a British doctor told the Trade Union Congress recently. Dr. A. Elliott, Delegate for the Medical Practitioners' Union, told the annual conference of Britain's 8,000,000 organised workers that Britain has on average one doctor for every 2,300 of the population. The United States, which has no national health service has one doctor for every 1,600, he added.

Dr. Elliott warned that the supply of doctors from the Commonwealth could not be relied upon indefinitely and added "it takes seven to ten years before your medical student is available to the practising doctor and the situation is urgent".

The Congress in a resolution asked the Government to review immediately the policy of restricting entry to the medical profession and to reopen the medical schools to as many suitable candidates as possible.

Mysterious Disease

The recent Soviet nuclear tests may be the cause of a mysterious disease outbreak near Elpoton, Guatemala's health officials said on 13-9-61. Symptoms of the disease are "a sensation of excessive heat, almost asphyxiating, and skin eruptions appearing as bleeding wounds". Guatemala, it was reported, was considering asking the United Nations to send an investigating team there, and calling for the help of the World Health Organisation.

International Congress of Allergology

More than 50 specialists from all over the world are scheduled to present and discuss latest findings in allergy research at the Fourth International Congress of Allergology, which will be held on October 15-20, 1961 at the Commodore Hotel.

Experts from the United States, Europe, South America, Asia, Africa, Australia and the Middle East are scheduled to take part in the five-day programme. Preliminary reports indicate that more than 1,200 Congress members from all over the world will attend.

Highlight of the first day's session will be an address by Dr. Justin M. Andrews, director of the National Institute of Allergy and Infectious Diseases, Bethesda, Md. Dr. Andrews will speak on "Research in Allergology".

Further information from Schless and Company, 59 East 54 Street, New York.

Chest Physicians Plan Congress in India

The Seventh International Congress on Diseases of the Chest, sponsored by the Council of International Affairs, American College of Chest Physicians, will be held in New Delhi, India, February 20-24, 1964. The congress will be presented under the auspices of the University of Delhi, the Indian Association for Chest Diseases, and the Vallabhbhai Patel Chest Institute. Officers of the congress are Dr. Raman Viswanathan, President, Dr. S. K. Sen, Secretary-General, Mr. Shri S. Ratnam, Treasurer, and Dr. P. U. Rao, Secretary of the Organising Committee.

The scientific programme will be organised under the direction of Dr. Andrew L. Banyai, Director of International Affairs of the American College of Chest Physicians. In addition to formal lectures by eminent scientists from all parts of the world, there will be panel discussions, motion pictures and fireside conference on subjects relating to all aspects of the diagnosis and treatment of diseases of the heart and lungs. Some of the highlights of the programme will be on recent advances in cardiopulmonary physiology, cardiovascular surgery, antibiotics, bronchial asthma and emphysema, tuberculosis and other pulmonary diseases.

Additional information from the American College of Chest Physicians, 112 East Chestnut Street, Chicago 11, Illinois, U.S.A.

Egyptian's Work on Cholera Praised

Calcutta University has conferred the degree of Doctor of Science in Public Health on an Egyptian, Mr. Aly Heidar Abou-Gareeb. He is the first research scholar to receive the distinction in a decade. The thesis which he submitted and was highly commended by examiners was entitled "the problem of endemic cholera, with particular reference to Calcutta city."

Mr. Abou-Gareeb, a staff member of the Epidemiology Department of the High Institute of Public Health, Alexandria, was awarded a W.H.O. fellowship for a limited period for research work. He worked under Dr. S. C. Seal at the All India Institute of Hygiene and Public Health, Calcutta, from May 1958 to March 1960.

Col. M. L. Ahuja, Public Health Adviser, W.H.O., one of the examiners of the thesis, commented that Mr. Abou-Gareeb carried out investigations with commendable zeal. The results of his study threw light on some of the important environmental factors responsible for the persistence of endemicity in bustees and in the congested and dirtier parts of the city.

Protection from Radiation

The question of protection of workers against ionising radiations will be one of the matters covered in the proposed Bill to amend the Atomic Energy Act, 1948 to be introduced in Parliament shortly.

The Bill, it is learnt, will seek to empower the Government to issue rules and regulations governing the safe use of radiation sources.

In view of the proposed legislation, the Government of India has come to the conclusion that the conventions adopted by the International Labour Conference held at Geneva in June last on the subject of protection against ionising radiations need not be ratified at this stage.

The I.L.O. conventions make detailed provisions to be given effect to by means of laws or regulations or codes or practice for the protection of workers against ionising radiations. They also cover matters like fixing of maximum permissible levels of ionising radiations, methods of protection, monitoring, medical examinations, inspection, etc.

Vegetable Fats and Coronary Heart Disease

The Union Government has come to the conclusion that there is at present no definite evidence to show that consumption of high amounts of hydrogenated vegetable fats alone can produce coronary heart diseases.

However, a high intake of vegetable fat may produce one of the factors known to be associated with coronary heart disease.

This conclusion of the government was announced by Dr. D. P. Karmarkar, Minister of Health, in the Lok Sabha on August 11.

The conclusion was based on the studies carried out at the Nutrition Research Laboratories on monkeys with hydrogenated vegetable fat and other fats and oils.

The studies have shown that distribution of hydrogenated vegetable fat equally in all the meals of the day results in considerably less increase in the serum cholesterol than consuming the same amount all at one sitting.

The intake of hydrogenated vegetable fats at moderate or low levels (10 to 15 per cent of total calories in the diet) is associated with no significant increase in serum cholesterol levels. If consumed in high amounts, that is, supplying nearly 40 per cent of the total calories in the diet, hydrogenated vegetable fats tend to increase serum cholesterol concentrations significantly.

Another conclusion reached is that if 20 to 30 per cent of the total hydrogenated fat intake is replaced by unhydrogenated vegetable oils which are rich in fatty acids, the increase in serum cholesterol brought about is considerably less.

Research Body for Heart Disease

An Indian Heart Foundation, a private venture, expected to be registered shortly, under the Indian Companies Act, is being established for conducting research in heart diseases, Mr. D. P. Karmarkar, Minister of Health, said in the Lok Sabha on August 17. Mr. Karmarkar, who was replying to questions said that the Central Government had not been approached so far for any assistance. Already much research in heart diseases was being carried on by private medical experts and the object of the proposed foundation was to canalise such research through it.

Asked whether it was a fact that the incidence of heart disease in India was increasing, Mr. Karmarkar said that it had been found that owing to a variety of causes like strain, there were more cases of heart attacks in urban areas. But generally speaking, Indians were "stout hearted".

Asked about the effects of vegetable fats on the heart, Mr. Karmarkar said that the preponderant opinion of heart specialists in the United States and other countries was that too much consumption of any fat created conditions which might lead to heart diseases.

'One Dose' Malaria Cure

New drugs were being developed which were expected to cure malaria after only one dose, said Dr. P. M. Kaul, Director of the World Health Organisation, addressing a meeting of Australian doctors at Melbourne.

He added that there were also good prospects for a vaccine against infectious hepatitis and powerful new insecticides, now almost ready for release which would wipe out all disease-carrying insects in ships and aircraft.

Medical Uses of New Organic Compounds

The current research work in the field of organic chemistry concerning the development of drugs and the synthesis of organic compounds, with potential uses in medicine or industry, is described in a number of research papers published in the latest (July) issue of the *Journal of Scientific and Industrial Research*, published by the Council of Scientific and Industrial Research.

Organic chemists at the Haffkine Institute, Bombay, have been working on the preparation of derivatives of thiourea possessing better anti-tubercular activity than the parent substance. Of the 25 compounds synthesised, one compound has been found to inhibit the growth of the tubercle bacilli. Similarly, from isonicotinic acid, a well established drug in the treatment of tuberculosis, derivatives, called isonicotinic acid hydrozones, have been synthesised and tested at the Central Drug Research Institute, Lucknow. Some of these new compounds have been found to possess activity comparable to that of isonicotinic acid and, in addition, they are three to four times less toxic.

Investigations on the synthesis of local anaesthetics, more potent but less toxic than the ones now in use, are in progress in the Chemistry Department of the Banaras Hindu University. Ten new derivatives of thiazolidones, as these chemicals are termed, have been synthesised and pharmacological tests have shown two of the compounds to be highly effective as local anaesthetics.

Research in Radiation Medicine

The Union Government would shortly set up in Delhi an institute for research in radiation medicine in the country.

The Deputy Minister of Defence, Mr. K. Raghuramaiah, told that the initial cost of establishing the institute would be about Rs. 9 lakhs. At the initial stage it would consist of laboratories for research and for treatment and diagnosis of patients by radioactive isotope techniques.

Triple Vaccine to be made at Kasauli

The Central Research Institute at Kasauli is being developed as a major centre for production of diphtheria, whooping cough and tetanus vaccines and their combination in a triple vaccine.

A World Health Organisation Consultant has discussed the production, testing and storage of vaccine with the director of the institute. He demonstrated in detail methods of vaccine production and drew up a list of equipment and chemicals required. The equipment for the unit will be provided by the United Nations International Emergency Fund.

A medical officer from the institute will leave for Britain this month on a WHO fellowship to study modern methods of production.

Nutrition Programme in West Bengal

Dr. D. D. Hill, Director, Wheat Associates, and Mr. James O'Brien Howard, Director, Trade Projects Division Foreign Agricultural Service, U.S. Department of Agriculture, visited on 12-9-61 three projects of Aryasthan Social Centre, a social welfare organisation in Calcutta.

Wheat Associates, a U.S. overseas organisation doing market development for wheat growers has been co-operating with local agencies in promoting nutrition education and greater utilisation of wheat.

Working in co-operation with the foreign agricultural service of the U.S. Department of Agriculture, Wheat Associates develop specific projects for different areas. The U.S. Government contributes towards the cost of these projects out of P.L. 480 funds, five per cent of which is earmarked for market development.

One example of this work is their aid to the activities of the Aryasthan Social Centre, to whom they have presented a jeep, a non-recurring grant of Rs. 30,000 and a recurring grant of Rs. 15,000.

A month ago, Wheat Associates donated Rs. 30,000 and two jeep station wagons with trailers and accessory equipment, to the Food, Relief and Supplies Department of the Government of West Bengal, to aid their mobile extension nutrition programme.

Request to UNICEF for TB X-ray Sets

In view of the tight foreign exchange position, the Government of India has asked the UNICEF to help India's tuberculosis control programme by supplying X-ray sets and other laboratory equipment.

The UNICEF has already placed orders for equipping 20 TB clinics and allotted a sum of $316,000 to purchase equipment for another 20 clinics next year.

The Government has had to bring down its targets under the national tuberculosis control programme owing to shortage of trained personnel and paucity of funds.

Rs. 370 lakh Expansion of Pimpri Plant

Hindustan Antibiotics at Pimpri will be further developed at a cost of Rs. 370 lakhs during the Third Plan period, Mr. S. T. Raja, Managing Director, said recently at a function at which a new badminton hall, constructed at a cost of Rs. 80,000 in the residential colony, was declared open by a former cricket test captain, Mr. Vijay Merchant.

Mr. Raja said the scheme included the erection of a streptomycin plant at Rs. 270 lakhs, a tetracycline plant at Rs. ten lakhs, a hamycin (a new antifungal, discovered in the Pimpri research laboratory) plant at Rs. 30 lakhs and a Vitamin C plant at Rs. 60 lakhs.

Nilratan Sircar Centenary

The Vice-President, Dr. Radhakrishnan, is likely to open the Nilratan Sircar centenary celebrations on October 1 at Mahajati Sadan, Calcutta. The birthday centenary of Dr. Sircar, who was noted for his outstanding contributions to medical science and education, will also be celebrated in Delhi, Patna and several other Indian cities during the first week of October. Dr. Roy is the president of the West Bengal Centenary Celebrations Committee. The Union Government will bring out a special postal stamp to commemorate the centenary.

Dr. B. C. Roy Casualty Surgery Institute

Dr. B. C. Roy Casualty Surgery Institute, the first of its kind in Asia, is going to be built shortly at a cost of about Rs. 16 lakhs in Calcutta as an adjunct to R. G. Kar Medical College Hospital.

The final blue print of the institute has been approved by the committee concerned and its foundation-stone-laying ceremony will be held before the year is out.

Besides housing the emergency surgical block, the three storeyed building will have specialised wings for urgent cases in addition to a research department to go into the cases of accidents involving aeroplanes and motor cars, factory mishaps and the like.

The institute aims at advancement of surgery under specialised care and knowledge and will cater chiefly for outdoor cases with arrangements for temporary indoor patients as well.

Already a sum of Rs. 8 lakhs has been collected by R. G. Kar Medical College students and staff members. The building will be erected on a two-acre plot of land

contiguous to R. G. Kar College Hospital. A further sum of Rs. 8 lakhs is proposed to be raised through public donations, the State Government contributing a major share.

More Medical Aid and Cheap Medicines

Mr. K. M. Panikkar, Vice-Chancellor, Jammu and Kashmir University, delivering the inaugural address at the Amritsar Medical College on 1-9-61, stressed on the need for extending medical facilities by providing more hospitals and cheaper medicines. The Vice-Chancellor said the State should take responsibility for providing medical treatment to every patient. "The Government which does not provide free elementary medical treatment and cheap medicines cannot claim to be a welfare and modern Government," he added.

Mr. Panikkar also stressed the need for scientific education and medical research in the country.

Association of Pathologists

"The efficiency with which medicine is practised in a community will depend greatly on the efficiency of the available investigational methods. To be effective, such a service must work in the closest association with the clinician and the patient", said Dr. Col. N. C. Chatterjee, Joint Director of Health Services, West Bengal, in the course of his address as chief guest at the first anniversary ceremony of the Indian Association of Clinical Pathologists held on 9-9-61 at the I.M.A. Hall, Calcutta.

The aims and objects of the Association are : to raise the status of clinical pathologists in the scientific world by virtue of higher standard of knowledge and technique; to fight against unhealthy competition and substandard practice and to strengthen the bond of mutual co-operation and fellow-feeling among the members of medical profession.

Anti-Tuberculosis Campaign in the State of Maharashtra

In order to revitalise all activities connected with the prevention and treatment of tuberculosis the Government of Maharashtra has decided to launch an Anti-Tuberculosis Campaign from 10th October, 1961, for a period of one month. The Dy. Director of Medical Services, Bombay Division requests for co-operation of all medical men during the campaign. Refresher Courses and Seminars are being arranged in all the four Divisions of the State.

Health Conditions in India in July

Mild incidence of plague was reported from Kolar district of Mysore throughout July 1961 and from Salem district of Madras State during the second and third weeks. Cholera and smallpox continued to be reported from some parts of the country.

The following detailed information is based on the preliminary reports received up to the week ended July 22, 1961.

Cholera : Epidemic conditions were reported from Mirzapur district in Uttar Pradesh during third week whereas heavy and mild incidence was reported during the first and second weeks. Heavy incidence was reported from Sholapur district in Maharashtra and Varanasi district in Uttar Pradesh during the third week whereas considerable and mild incidence was reported during the preceding weeks. Heavy incidence was reported from Darbhanga and Monghyr districts in Bihar during the second week and Nizamabad district in Andhra Pradesh during the first week whereas only mild incidence was reported during the other weeks. Considerable incidence was reported from Lucknow and Pratapgarh districts in Uttar Pradesh and Calcutta city during the first week whereas mild incidence was reported during other weeks. Mild incidence was also reported during the month from Srikakulam, Krishna, Visakhapatnam and Chittoor districts in Andhra Pradesh, Sharsa, Muzaffarpur, Shahabad, Champaran districts in Bihar; the districts of Mandla, Durg, Bilaspur and Rewa in Madhya Pradesh; Ahmednagar, Nanded, South Satara, Poona, Parbhani, Osmanabad, Bhir and Aurangabad in Maharashtra; Bijapur and Gulberga districts in Mysore; the districts of Allahabad and Gorakhpur in Uttar Pradesh; the districts of Nadia, Birbhum and Midnapur in West Bengal.

Smallpox : Considerable incidence was reported from Wardha district in Maharashtra and Madras city during the first and second weeks respectively whereas only mild incidence was reported during other weeks. Mild incidence was also reported from the districts of Cuddapah, Krishna, Nizamabad, Nellore, Chittoor, Visakhapatnam, Anantapur, West Godavari, Kurnool, Khammam and Hyderabad in Andhra Pradesh; Kamrup district in Assam; Ahmedabad district in Gujarat; Trichur and Palaghat districts in Kerala; the districts of Salem, Ramanathapuram, Tirunelveli, South Arcot, Tanjore and Coimbatore in Madras; the district of Nagpur, Bhandara, Poona, Buldana and Greater Bombay in Maharashtra; the district of Bangalore, South Kanara, North Kanara, Tumkur, Coorg, Belgaum, Dharwar, Mysore and Kolar in Mysore; Sundergarh district of Orissa; the districts of Ambala, Hoshiarpur, Sangrur in Punjab; Udaipur district in Rajasthan; the districts of Bareilly, Faizabad, Kanpur, Lucknow, Allahabad, Bahraich, Etawah, Muzaffarnagar, Aligarh, Sitapur, Rae Bareili, Varanasi, Budaun, Deoria, Jhansi, Mirzapur, Nainital, Unao, Jalaun and Mathura in Uttar Pradesh; the district of Burdwan and the Calcutta city in West Bengal and the Union Territories of Delhi and Pondicherry.

Gastro-enteritis : 998 cases and 278 deaths were reported from Uttar Pradesh during week ended July 22, 1961, as against 1,130 cases and 332 deaths reported during the previous week and 1,114 cases and 333 deaths reported during the week ended July 8, 1961.

I.M.A. Delegates to XV General Assembly of WMA

Dr. A. P. Mittra, Hony. General Secretary, Dr. Ved Prakash, Hony. Joint Secretary of the Indian Medical Association and Dr. P. K. Guha, Hony. Editor of the

Journal of the Indian Medical Association left for Rio de Janeiro, Brazil, to attend the XV General Assembly of the World Medical Association, Dr. Mittra and Dr. Ved Prakash as delegates and Dr. Guha as alternate delegate to the Assembly; Dr. Guha also representing the Journal of the I.M.A. at the World Medical Editors' Confererence at the same place.

REVIEWS

Radioactivation Analysis (Proceedings of the Radioactivation Analysis Symposium, Vienna, June 1959), Scientific Editor, Bryan R. Payne; 1960, Butterworth's Publications, London, W.C. 2; 9"×6", pp. 141; 30 sh. nett.

Radioactivation analysis is a relatively new technique devised for the estimation of minute quantities of substances. It represents a very useful and relatively cheaper application of atomic energy, and practically all sciences stand to gain by its development.

The Joint Commission on Applied Radioactivity should, therefore, be congratulated on its efforts to bring together people from various countries and initiate exchange of ideas through an international symposium held in Vienna in June, 1959. The papers read at the symposium cover quite an extensive ground, ranging from the instrumentation involved in radioactivation analysis to the interpretation of results obtained in specific fields. Also the organisers of the symposium made it a point to include papers dealing with the general aspects of possible application of the technique to various fields, such as industries in general, biochemistry, medicine etc. The book under review is a collection of these papers (twelve in all) which include quite a significant bibliography. The inclusion of the discussion after the papers is a very useful feature of the book, and should go a long way to help the reader in getting a more balanced view of the contents of the papers.

The book is well-bound. All the papers except two are in English, the two being in French.

M. De

Sea Within (The Story of our Body Fluid)—By William D. Snively, Jr., M.D.; 1961, Pitman Medical Publishing Co., 39 Parker Street, London, W.C. 2; 8½"×5½", pp. x+150; 32 sh. net.

In this book the author has made an attempt to tell the story of our body fluids to the 'lay-man' in a popular language. He has succeeded completely in his endeavour.

There are 24 profusely illustrated chapters in this book. The story of Water and Salts of the body and its regulation by the kidney and the endocrines has been presented in such an interesting way that everybody will read it with absorbing interest.

The question of Acid Base Balance, intimately connected as it is with the Water and Salts of the body, has received appropriate attention. The essentials of Dietetics and Nutrition have not been left out of consideration.

Considering the complicated nature of the problems discussed, the popular and interesting way in which the materials have been presented deserves special mention. It is sure to make an interesting study not only for the 'medically minded lay people' but also for medical men themselves.

H. L. S.

The Control of Disease in The Tropics—By T. H. Davey and W. P. H. Lightbody; Second Edition, 1961, H. K. Lewis & Co. Ld., 136, Gower Street, London W.C. 1; 9½"×6½", pp. xii+422; £2 7s. 6d. net.

The desirability, in a work of this nature, of keeping pace with the remarkably rapid development of the field which it appears to cover, has rendered necessary the revision of the material presented in the first edition which appeared in 1956. New chapters on Poliomyelitis and Health Education have been included and large sections of others re-written to bring them up to date. The book is intended for the medical practitioner with public health responsibilities in underdeveloped areas.

In general, the book is based on the lectures on the subject given at the Liverpool School of Tropical Medicine. The diseases dealt with are selected ones arranged in groups according to the mode of transmission and the circumstances which govern man's exposure to infection, since these factors largely determine the control measures which can be applied. The chapters on sanitation are confined to simple methods and procedures which are considered applicable in the conditions which prevail over the greater part of the rural tropics. Many of the epidemiological features have been presented with vivid and instructive illustrations. There is a chapter on food requirements and dietary surveys but dietetic diseases do not seem to have received adequate attention. The last chapter is devoted to vital statistics. Finally, information and techniques of use in the application of the control measures recommended are included in the Appendix.

Most text-books on tropical medicine have been written with clinical bias and deal only briefly with the important problems of prevention and control; as such this book goes a long way to meet the gap.

R. N. Chaudhuri

Surgical Diseases of Chest—By Brian Blades, M.D., 1961, C. V. Mosby Company, St. Louis, U.S.A.; 10"×7", pp. 580; $22·00.

The need for a comprehensive book on the various aspects of diseases of the chest has long been felt. Advances in this branch of medicine have been so rapid in the last 10 years that it was difficult for a clinician to keep abreast of recent knowledge and to accept the really important gains and reject those which are relatively unimportant. Developments in cardiovascular surgery have been most striking in this respect.

The appearance therefore, of this book which has been contributed to by 18 authorities each in their special fields, is very welcome. All the contributors are from the United States and naturally the book is

slanted towards the American viewpoint in many controversial problems. Each chapter bears the stamp of an authority and the book therefore can be read by surgeons, internists and even practitioners with much profit. The extensive references and bibliography at the end of each chapter add even more to the value of the book as a reference volume.

It is difficult to pick out those chapters which are outstanding but the chapter on Thoracic Aorta and Blood Vessels from DeBakey's group and that on Congenital Heart Disease by Harken and his colleagues appeared to the reviewer even better than most and give the most recent advances in this field.

In summary, the book can be said to be authoritative, comprehensive, extremely well presented and succint.

A. K. BASU

From Girlhood to Womanhood—By Albert Sharman, M.D., D.SC., F.R.C.O.G., with a foreword by Lady Isobel Barnett, M.B., Ch.B.; 1960, E. & S. Livingstone Ltd., Edinburgh and London; 7¼″×4¼″, pp. viiii+72, with diagrams; 6 sh. net.

This little volume, written for the lay reader by an experienced gynaecologist, is designed for the mother of the female teenager. It is now universally accepted that the problems facing "the growing-up of the adolescent girl" must be faced openly. This is best done by her mother. In the earlier chapters of the book the author has given a clear and concise account of the various psychological changes which appear in the female during adolescence. It will help the anxious mother to prepare her daughter for the onset and hygiene of menstruation. The later chapters are concerned with pregnancy, antenatal care, labour and infertility, and will be found suitable for young married women. This simple non-technical account of the physiology and pathology of reproduction can be recommended for the education of adolescent girls. The get-up of the little volume is excellent.

J. DHAR

OBITUARIES

Dr. M. K. Desai

Dr. M. K. Desai was born in 1900. He qualified as an M.B.B.S. in 1926 from the Grant Medical College, Bombay.

After graduation he started private practice in Bombay continuing there upto 1930. Thereafter he joined a charitable dispensary at Surat as a medical officer in which capacity he worked upto 1940. From 1940 to 1950 he practised independently at Surat. He was an active member of the Surat Branch of Indian Medical Association.

Dr. Desai was also a Councillor of Surat Borough Municipality from 1934-1940 and was selected a member of the Standing Committee. He used to take particular interest in the health of students.

Dr. Desai was a good sportsman. He was kind-hearted, benevolent and was always ready to help the poor and the needy.

In 1959, Dr. Desai came to Navsari to pass a quiet and peaceful life. He was a member of Navsari Medical Union. He expired on the 15th July, 1961.

DR. M. K. DESAI

MAJOR S. N. SEAL

Major Satyendra Nath Seal

Major Satyendra Nath Seal, son of Late Rajendralal Seal and nephew of Late Sir Brojendra Nath Seal was born in August, 1891. He graduated from Edinburgh University and joined the World War I. He practised in the United Kingdom for a considerable time. After returning to India in 1922 he joined the S. K. Burman's Charitable Dispensary and also the Calcutta Nursing Home as a medical officer. He was one of the founder members of National Infirmary at Gorachand Road, Calcutta. In 1934 he joined Seraikella State Service as the Chief Medical Officer. He left Seraikella State and went to England in 1937 to get specialised training in tuberculosis. On returning to India he joined Sir Hassan Suhrwardi's Chest Clinic and National Infirmary. After that he became Chief Medical Officer of Bilaspur State (Simla Hills). During World War II, Major Seal left State Service and joined the Indian Medical Service. After the war he returned to Bilaspur State and worked there as Chief Medical Officer till his retirement. He then settled in Calcutta at his own residence.

Major Seal died suddenly on 6th August 1961 at his own residence. He was 70. He left behind his wife, two sons, grandchildren and a host of relatives and friends to mourn his death.

XXXVII ALL-INDIA MEDICAL CONFERENCE, 1962, KANPUR

Brisk arrangements for the 37th All India Medical Conference to be held at the G. S. V. M. Medical College, Kanpur, on January 4-6, 1962, under the Presidentship of Dr. R. V. Sathe of Bombay are being made by the Kanpur Branch of the Indian Medical Association. A Scientific, Pharmaceutical and Medico-photographic Exhibition is being organised. A Souvenir is being published and Scientific lectures on the latest researches and improvements in the modern treatment of diseases are also being organised.

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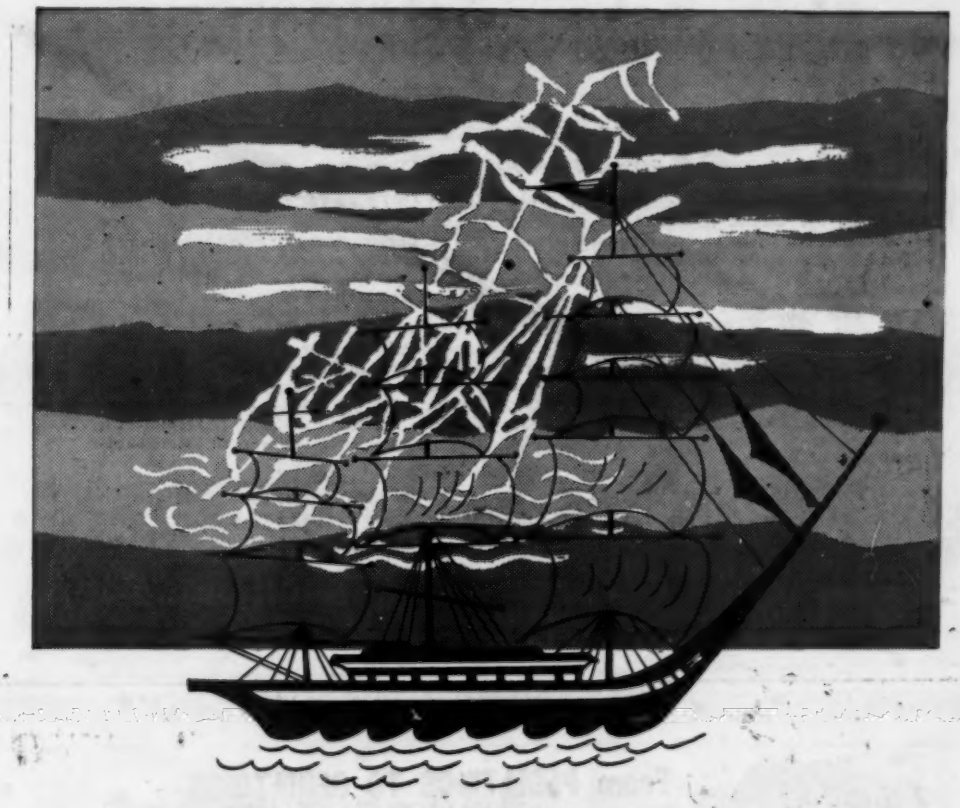

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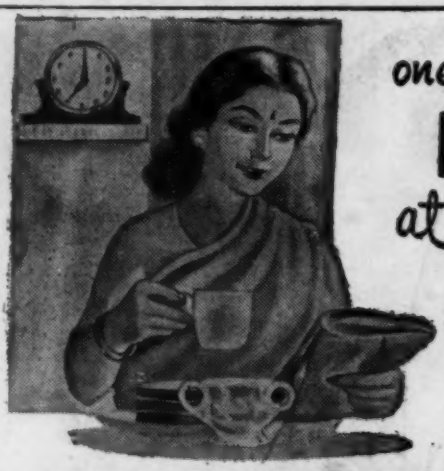

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